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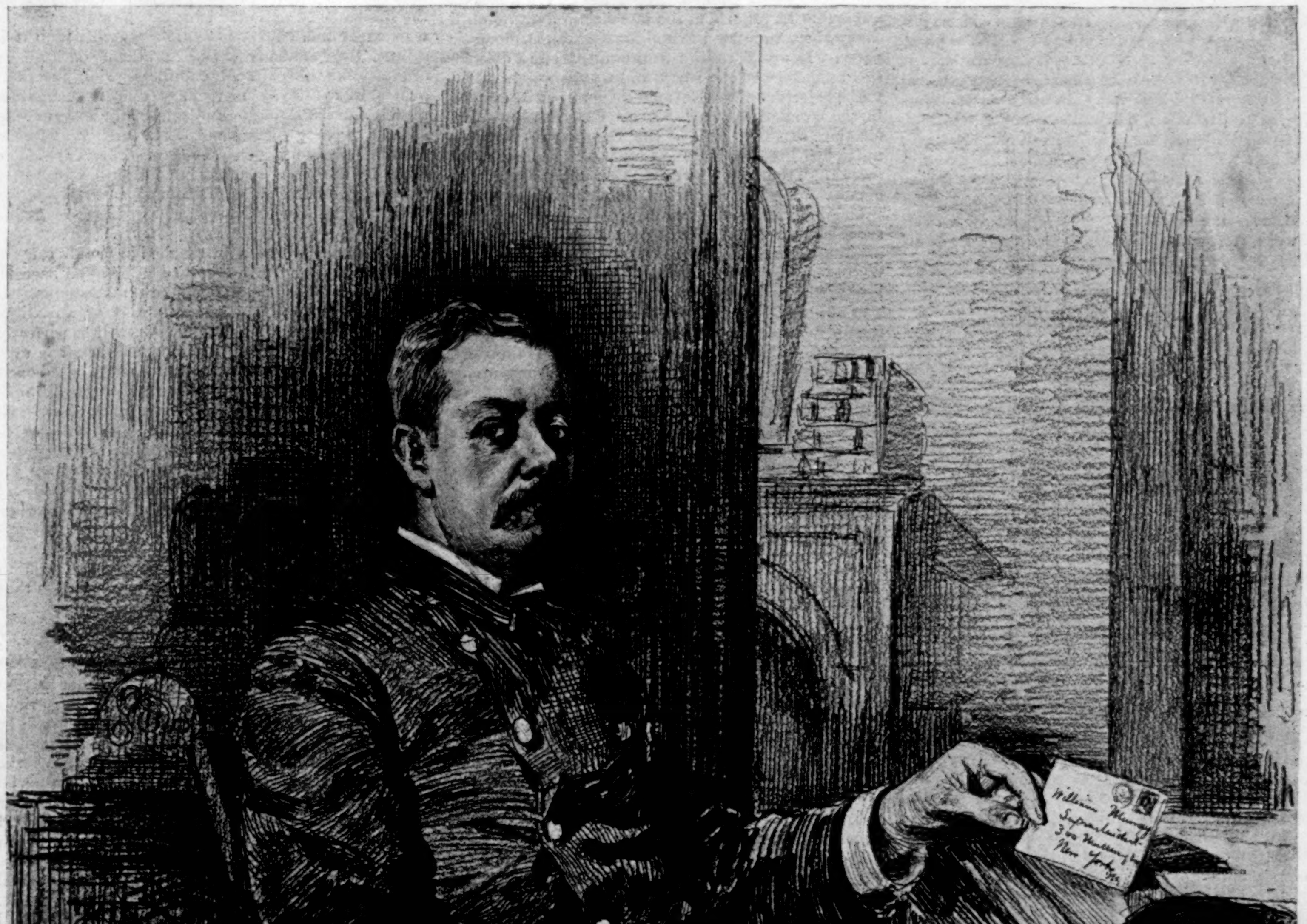

SUPERINTENDENT MURRAY, OF THE NEW YORK POLICE FORCE.—DRAWN FROM LIFE BY ARTHUR J. GOODMAN.—[SEE PAGE 22.]

Smalley's London Letters.

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PRESIDENTIAL SPECULATIONS.

THE national nominating Conventions will not be called for more than a year, and will not assemble until a year from next summer. But the popular fondness for political speculation is so general that the probabilities of the action of the Conventions are already warmly discussed, especially upon the Democratic side. The chance of President HARRISON'S renomination lies in his position as the head of the civil service, not in his personal popularity. Mr. BLAINE must be always considered a possible candidate. But, besides the fact of his defeat in 1884, there is now a strong Republican opposition to him to be reckoned with. In the situation of to-day Mr. ROBERT T. LINCOLN is the most promising Republican candidate, which is a curious illustration of the forces that control our politics. On the Democratic side there are but two candidates mentioned, Mr. CLEVELAND and Governor HILL. They are both of New York, whose electoral vote is essential to Democratic success. Mr. CLEVELAND, like Mr. BLAINE, has been once defeated. But while the Republican party rallied in 1888, it was disastrously beaten upon its chosen issue in 1890, and the issue upon which Mr. CLEVELAND was beaten in 1888, and of which he is the distinctive representative, was enthusiastically approved in 1890.

But nominations are not logical, and they seek negative rather than positive men. The patriotic enthusiasm which great military success and distinction awaken may be counted upon to bring an eminent and successful soldier into the Presidency. But political service does not secure the same enthusiasm for a statesman, as the instances of CLAY, the leader of the Whigs, and of SEWARD, the Republican leader, show. Mr. CLEVELAND is the popular Democratic leader of to-day; he is the logical candidate of his party; he represents both its chief issue and its new spirit; he would command a large vote beyond his party, which would not be given to any other Democrat, certainly not to Governor HILL; his former administration and his course in retirement have made him popularly stronger than he has ever been; but for all that his nomination cannot be assumed as certain. The opposition to him is strongest in his own State, and it is thoroughly organized, while his friends are not organized at all; it controls the party machine, which is very powerful in the election of delegates. The fact of his acceptability to a great body of independent voters is disagreeable to the traditional "Democracy," and the feeling between the extreme CLEVELAND and HILL Democrats in New York is so bitter that intelligent Democrats elsewhere cannot help heeding it when the decision must be made.

It is the doubt of the fidelity of the opposing wing in New York, in the event of the nomination of either Mr. CLEVELAND or Governor HILL, that makes the nomination of either doubtful. In the probable judgment of the wise heads of the Democratic Convention the nomination of either would imperil the vote of New York. If this view be correct, the nomination would go elsewhere. That result would be undoubtedly satisfactory to the HILL "boomers," for apparently the whole HILL boom is merely a device to defeat the nomination of Mr. CLEVELAND. The HILL boomers care less for HILL'S success than for CLEVELAND'S defeat. The movement is inspired by personal hostility to Mr. CLEVELAND. But there is something else to consider. The failure to nominate Mr. CLEVELAND, who stands for the conviction and spirit that triumphed at the late election, would chill everywhere the new life and hope of the Democratic party. It would restore to prominence the discredited tendencies of the party, and would be equivalent to the rejection of the Democratic policy as illustrated in the course and views of Mr. CLEVELAND. The election of 1890 compels the Democratic party to make tariff reform the chief issue of 1892, and to set aside the Democrat who raised that issue would be so disheartening and absurd to the party that it would injuriously affect the campaign. The cry of measures not men, and that a party is greater than any of its leaders, cannot silence the demand for a man who is himself the author of the measure, and for a leader who is himself an inspiration for his party. The chill of Mr. CLEVELAND'S rejection would affect the Democratic party most seriously in the State to secure whose vote he would be rejected. If the HILL wing would connive at his defeat if he were nominated, what would be the effect upon the CLEVELAND wing if the HILL wing should succeed in setting him aside? These also are questions for the wise heads of the Convention.

THE ALDRICH RULE.

THE principle of a rule providing for closing debate in the Senate is sound. It is simply the principle of the rule of the majority. If the minority may rightfully prevent legislative action by the majority, our whole political system is subverted. If the minority may rightfully obstruct action, the necessary legislation for the prosecution of the war for the Union could have been prevented. Mr. EDMUNDS'S recent remarks upon this point are unanswerable. But it does not follow because a rule for closing debate may be properly provided by the Senate, that any rule which may be proposed is justifiable or wise. Because government is necessary in civilized society, it does not follow that despotism must be tolerated. Undoubtedly also, as Mr. EDMUNDS says, the general principle is as applicable to discussion upon a proposition to end debate as upon any other proposition. If the majority has the right to rule, the minority has not the right to prevent the majority from taking action upon a specific measure to close debate. All this is incontestable.

But all this does not justify the passage of the ALDRICH rule. That rule is not a proposition for generally closing debate, but for reaching a vote upon a particular bill at this session. The purpose is perfectly well known. It is not to enable the Senate always to reach a vote after reasonable discussion. It is to reach a vote upon the election bill. Now, while a proper rule for closing debate is permissible, the occasion for adopting it, not as a general rule, but to pass a particular bill, should be one where it is evident that public opinion strongly demands it. Since the organization of the Senate a century ago, and including a period of passionate debates that ended in civil war, such a measure has not been found necessary. Is there now such an extraordinary juncture, a public peril so flagrant and imminent, and a demand of the country so imperative, that the tradition of a practice which Senator HOAR has extolled as almost indispensable to the perpetuity of civil liberty should be overthrown? It is scarcely credible that Mr. EDMUNDS would assert it. He says, indeed, that what the partisan feeling of the country may declare is wholly immaterial to him, because when the country understands the rule, it will approve it.

But the Senator seems to us mistaken in this: that while the country undoubtedly approves the principle of the rule, it does not approve the form and the occasion, not because it is ignorant of them, but because it understands them thoroughly. The present form of rule is proposed not to meet an exigency which experience has shown to be intolerable, but to pass a particular bill which neither the majority of the Senate unitedly approves, nor the united party of the majority in the country. If the proposition were to relieve an intolerable exigency, the rule would be general. That it is not general is the proof that the argument urged for its passage at this time is deceptive. The custom described by Senator HOAR as a safeguard of freedom is to be overthrown in order that a bill may be passed which the country may be fairly said to have condemned at the late election by overwhelmingly defeating the party that proposed it. Events show that the Republican party has largely forfeited the confidence of the country. But should Senator EDMUNDS take the chair of the Senate and force the passage of the ALDRICH bill, not to facilitate legislation hereafter, but to secure the passage of a bill obnoxious to the general sense of the country, and for a wholly partisan object, his personal sincerity need not be questioned, but the national condemnation of his party would be more decisive than ever.

A MUNICIPAL PARTY.

THE Committee of the People's Municipal League has decided upon a permanent organization to make effective at the polls the widely diffused conviction that the management of the city should be free from the influence of national politics. The proof of the wisdom of this course is the sneer with which it is saluted by Tammany Hall. Tammany is itself an organization of political gamblers, who, for their own profit and by mercenary and unscrupulous means, control the ignorant vote of the city, and by appeals to party spirit sophisticate intelligent Democrats. Its essential character was fully exposed in detail by the *Evening Post* last autumn, and an astounding illustration of Tammany success was the certificate of its candidates signed by many reputable citizens.

Such an organization, intrenched in venality, ignorance, and party spirit, is not to be opposed successfully by occasional and temporary movements. It can be resisted only by a continuous organization, which, as every election approaches, will be perfectly prepared and ready. No great public work is ever effected without intelligent combination and co-operation, and no rally of minute-men, however enthusiastic and self-sacrificing, can cope in the long-run with trained veterans of the line. This is the sensible conclusion of the committee, and they therefore propose a permanent organization of those who agree that city affairs should be managed by honest and competent officers selected because of those qualifications, and not because of their views of national policy. How many of the citizens who signed the certificate for the Mayor would have selected him in their own business for a place corresponding to that for which they recommended him in the management of the business of the city?

The proposed organization is, for its purposes, a party, like all associations of the friends of great public objects. They are opposed to other parties that favor objects and methods which are injurious to the public welfare. The new organization will be the party of those who think that national politics should be excluded from the management of the city, and it will be opposed to the party of those who think that city officers should be selected for their national politics, and the city government controlled by such men and for such purposes as those which were made public by the *Evening Post*. It will be the party of non-partisan honesty, efficiency, and economy, as against the party of partisan rascality, corruption, and extravagance, and its fortunes will measure the capacity of the city for sensible self-government.

IN THE BAD LANDS.

IF the reported interview of RED CLOUD with Father FRANCIS M. CRAFT be authentic, it is worthy the careful attention of every honorable and intelligent American. The interview is published simultaneously with the statement of General MILES, and the two furnish an aspect of the Indian question which is most important. The important point is their agreement in the affirmation of the great wrongs of the Indians from the whites. This is not, as many persons seem to think, a sentimental view. Neither General MILES nor RED CLOUD is a sentimentalist, and when they say that we have lied to the Indians and cheated them and starved them, it is not half so sentimental a statement as that of our fathers in the Declaration of Independence. RED CLOUD'S review is an exceedingly forcible, detailed, and conclusive arraignment of the Indian Department, and the graphic story told by him is very much more pathetic than the speech of LOGAN. It is as powerful an accusation as was ever made against a great nation by the spokesman of an oppressed and outraged people.

General MILES confirms much of the allegation of RED CLOUD, although he attributes a great deal of the trouble to the arming of the Indians by the government, and to Indian duplicity, of which the report from BIG FOOT'S band seems to be a confirmation. The Indians claim, says General MILES, and he evidently thinks with reason, that the government has not fulfilled its treaties, and that they have suffered from want of food and other outrages. They are constantly moved, and constantly exposed to the management of new agents, who, as RED CLOUD says, "take care of themselves and not of us," and "it is very hard to deal with the government only through

them." As for the remedy of this state of things, which will expose the frontier to ravages and the government to enormous expense as long as it continues, General MILES says that it lies in a government just and strong enough to control the Indians.

That is a safe generalization. But the first step is rather a government just and strong enough to keep its own word. It engages to civilize and educate the Indians, and it cannot do this under the present system of partisan agents and a political Indian service. Mr. REMINGTON, in his late admirable illustrated article in the WEEKLY, proposes to turn over the wild Indians to the War Department, and make a semi-military organization in the service of the government. General MILES apparently favors the same disposition of them. RED CLOUD says: "The Indian Department has almost destroyed us. Save us from it. Let the army take charge of us. We know it can help us. Let it manage our affairs in its own way." But if the problem be to educate and civilize the Indians into citizens, would the work be best accomplished by the War Department? An Indian bureau which should not be a political machine would be a good beginning, and such a bureau the present Commissioner would organize if he could have his own way. With such a bureau, with adequate appropriations honestly devoted to their purpose, with increasing schools and a sympathetic and friendly guidance, we should begin to recover Indian confidence in our good faith, which is the indispensable condition of any successful Indian policy except war and extermination.

LIBRARIES.

THE disposition to found libraries in this country is another illustration of the public spirit which is characteristically American, and also of the universal expectation that rich men will dedicate a part of their wealth to public uses. But with the increase of libraries the question of their selection and administration becomes of the highest importance. The theory that a librarian is merely a custodian of books, that the care of a library may devolve most properly upon invalid clergymen and men with a taste for books and curious reading, is now antiquated. It is happily replaced by the conviction that the usefulness of a library in any community depends chiefly upon the librarian, and that without a skilled and trained librarian, a library, instead of an arsenal where every weapon is burnished and in its place, and accessible in perfect order at every moment, is a confused pile of weapons practically useless, because unknown and unarranged.

The whole subject of the library, the way to make it most serviceable to the public, the thorough training of librarians for their duties, and all that may be called library science, are the concern of the American Library Association, composed of the chief librarians and library experts in the United States, which is now in its fifteenth year, and which holds an annual meeting for the consideration in papers and debates of library subjects. For instance, there is one which commends itself to every person who is interested in starting a small public library for a town or village. The money is not the most difficult thing to obtain. Massachusetts has passed a law giving a certain sum to every community that raises the same sum for a library. But if it is to be a collection of only three or four thousand volumes, the perplexing question is, how shall the books be selected?

When Mr. BRYANT founded a free library at Cummington, where he was born, he was able to choose the books. But if the town itself had supplied the money for the library it might not have been able to supply a wise choice of books. But well-instructed librarians can do this, as Dr. COGSWELL did at the beginning of the Astor Library. The association will promote all such indispensable work by stimulating public interest in libraries, and discussing their interests fully. It has already published an excellent little manual, *Reading for the Young*. To be able to do such things, and to print the most valuable of the papers read at its meetings, it requires a modest endowment fund, and Mr. PLINY B. SEXTON, president of the First National Bank, Palmyra, New York, is the chairman of the committee. A little money from many givers will be a large sum, and a large sum will be, as we know, very wisely expended for a most admirable purpose.

MR. GLADSTONE'S BIRTHDAY.

MR. GLADSTONE has just completed his eighty-first year, and his importance in British politics may be inferred from the fact that his age is one of the most decisive elements in the question of a dissolution of Parliament. GLADSTONE is eighty-one years old. That is the one fixed and certain fact. In two years he will be eighty-three, and presumably past the power of active leadership. If the ministry dissolves Parliament now, although the present situation of the Liberals is very unpromising, yet GLADSTONE is still a vigorous leader. There is a plain risk in dissolution now. The chances are that the Irish trouble will disintegrate the Liberal party, and a year or two hence, with that party demoralized and GLADSTONE older, the Tory prospect will be even brighter than it is now.

The evident opinion in England is that a few weeks ago the Liberal party, with a policy of Irish home-rule under English leadership, might have returned to power. This result was due to one chief cause—the conviction of the middle-class English mind that home-rule did not mean separatism, that it would practically end the apparently endless Irish trouble, and that it would be subject to conditions imposed by English good sense. But this is precisely the frame of mind which the PARNELL performance has shattered, and the English confidence, so long denied, so slowly won, and so suddenly lost, can be regained only very slowly.

All the circumstances tend probably to persuade intelligent Englishmen, however reluctantly, that Mr. GLADSTONE has generously deceived himself, and that there is not the quality in the Irish people which can be trusted to carry out a wise scheme of home-rule. This impression, however erroneous, evidently exists. Mr. LECKY'S view, who is of Irish descent and of Irish sympathy, is stated with great candor in the two concluding volumes of his *History of the Eighteenth Century*, and it is summarized in his recent article in the *North American Review*. It must have very great weight in England, and it confirms the impression that the settlement of the Irish question is now long postponed, and that the active career of Mr. GLADSTONE is ended.

THE QUESTION OF THE SEAL FISHERY.

VERY few people have followed the details of the diplomatic controversy about the seal fishery in the Behring Sea, in which a great deal of ability has been shown upon both sides. The correspondence is very long and clever, and there is undoubtedly some question of the exact extent of our purchase from Russia and of our rights. But nothing has occurred to show that it is not a question which should be submitted to arbitration. Nobody in this country or in England wants to fight about it, and if the clever negotiators cannot reach a conclusion they can agree to arbitrate, and with the approval of both countries.

War with England was long a trump card in American politics, but it is so no longer. The supposed necessity of conciliating the Irish vote, especially upon the Republican side, has led to some mortifying performances, like the shameful pandering to the TWEED ring in the city twenty years ago. But the United States will not go to war with England to win Irish votes until the situation is seriously changed. That there is no want of a sensitive feeling of national honor has been demonstrated to this generation, and it may be safely assumed that the administration will not choose a violent solution of the seal-fishery question.

PROTECT THE PARKS.

THE intelligence of the city of New York is constantly seeking to enlarge the area of pleasure-grounds for the benefit of the whole city, and especially of the poorer people. A wise law to that effect provides for such improvements at great expense. The proposition to permit the obstruction of such parks as already exist should be resolutely resisted unless some conclusive reason for such obstruction can be shown. But the greater convenience of an elevated railroad is not such a reason. Doubtless these roads would like to appropriate the whole Battery for their convenience. But why should the public consent?

Already the Battery has been partly occupied by the Sixth and Ninth Avenue roads, and upon the whole the occupation, so far as it extends, is justified by the public convenience. But if the roads now wish greater space, there is no reason that the city should farther invade the public grounds to gratify them. Access to the ferries is secured, and if the railroad companies desire more room, why should they not pay for it? There is plenty of adjoining land which can be bought and the buildings removed if necessary. The public has made a great concession in the disposition already made of the Battery for railway purposes. There is no occasion whatever for doing more.

NOTES TO THE POSTMASTER-GENERAL'S REPORT.

THE Postmaster-General and his late Assistant have been the most consistent and contemptuous violators of Republican pledges of reform. But neither of them shines in controversy with the Civil Service Commission, of which the majority is also Republican. The Postmaster-General, in his annual report, hoped that the civil service examinations for the Railway Mail Service will be improved by being made more difficult, and adds that clerks appointed from the eligible lists are inefficient and poor. The tone of these comments was offensive, and their object was evident to discredit the commission, members of which, during the investigation by the committee of the House, placed Mr. WANAMAKER in the very disagreeable light of truth in regard to certain statements and insinuations.

The commission now says that the Postmaster-General has never hinted to it that the examinations were inadequate, and that the usual complaint is of their severity. But more than that, it says that the examination and probation under which the Postmaster-General asserts that the Railway Mail Service had become the most effective body of civil servants in the country have been preserved without the least change, except one in the direction of reform, namely, an open competitive examination test for entrance, instead of the personal favoritism of nominations by members of Congress. The commission replies to the remark of the Postmaster-General that about a third of the clerks appointed from the eligible lists fail to fulfil the requirements, that the records show that of the 1525 eligibles appointed from the examinations up to June 30, 1890, about 145 have been removed or have resigned. Of these there were but 31 removals, and as doubtless the resignations were free, they should not appear in these figures. That is, instead of one-third only one-eleventh have been separated from the service. More than 90 per cent. have been retained, and they are undoubtedly satisfactory, or they would have been removed if the Postmaster-General had done his duty.

The commission refers to the remark of the Postmaster-General that the room of men appointed by the CLEVELAND administration "was more valuable than their bungling assistance." These men, to the number of 1500 or more, perhaps half of those appointed during the four years preceding, were removed between March 4 and May 1, 1889, and all had been appointed under the spoils system. From the Postmaster-General's own statement, therefore, it was the spoils system which had brought into the service the bunglers whose room was better than their company. Comparing this with the result obtained during the last year and a half under the reformed system, the enormous superiority of the latter is obvious from the Postmaster-General's report. A very small fraction of those appointed under the reformed system have been removed. The larger knowledge and logic of the commission have made the hostility of the Postmaster-General serve the good cause.

CORRECTION.

IN a brief notice in the last WEEKLY of the debate in the Senate on the LODGE election bill, the name of Senator HAWLEY was incautiously substituted for that of Senator STEWART, thus representing Senator HAWLEY as opposed to the LODGE bill, which he is understood to favor.

PERSONAL.

RUDYARD KIPLING is coming to this country in the spring to enjoy a hunting tour in the West before he goes to India, where he expects to spend much of his time during the next few years. Mr. KIPLING'S father is a clever artist, and has prepared a series of elaborate illustrations for his son's book *Black and White*.

—Apropos of the amusing baby bunco game by which a number of leading United States Senators were fleeced, it is said that over five hundred real or alleged infants have been named after CHAUNCEY MITCHELL DEPEW.

—The name of the late Mr. GEORGE BELL, of the London publishing firm of GEORGE BELL & SONS, was closely connected with the names and writings of some of England's best-known authors. Mr. WILLIAM MORRIS'S first book, *The Defence of Guinevere*, was published by Mr. BELL, as were Miss PROCTER'S first book of poems, COVENTRY PATMORE'S *Angel in the House* and his other works, and Mrs. GATTY'S and Mrs. EWING'S charming tales. Mr. BELL also attained a world-wide reputation among students as the publisher of "Bohn's Library," and he was the first editor of *Notes and Queries*.

—It is stated that Mr. F. MARION CRAWFORD is so worn out by overwork that he has been obliged to seek rest and health at the hot baths of Tiflis, in Asiatic Russia.

—High-Churchmen have been the chief subscribers to the Liddon Memorial Fund, which now amounts to $58,000.

—The most noted of Denmark's musical composers, NIELS WILHELM GADE, has just died in Copenhagen. At the age of twenty-eight his overture to *Ossian* was crowned, and he was pensioned by royalty. MENDELSSOHN and SCHUMANN were his warm friends. He was seventy-seven at the time of his death.

—At the recent annual dinner of "Old Carthusians," as the graduates of the Charterhouse School in London are termed, a number of the MSS. written by THACKERAY when he was at Charterhouse were displayed to the assembled guests. These fragments have been purchased by the governing body of the school, and will be treasured among its archives.

—FRANCIS WILSON, the comedian, has bought a chair formerly belonging to Sir WALTER SCOTT, and given by him to Sir EDWIN LANDSEER.

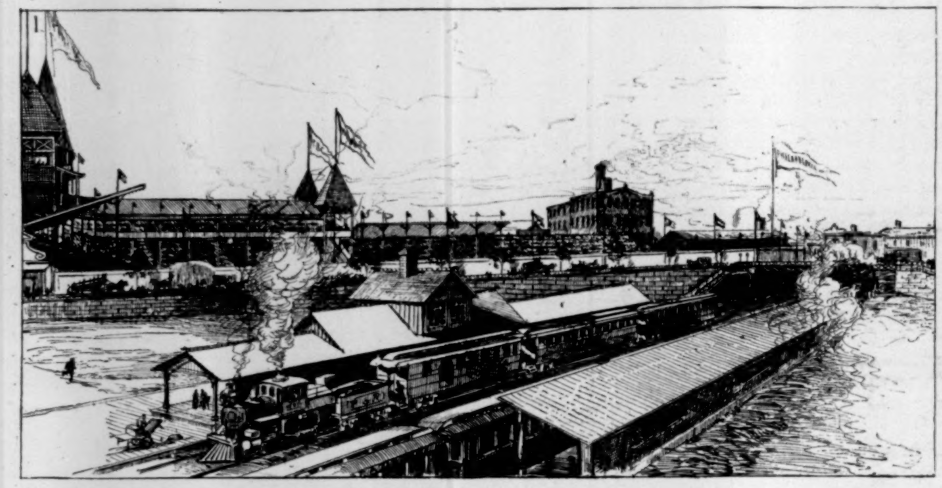
—The late Archbishop THOMSON, of York, England, was in his youth a curate of Bishop WILBERFORCE, with whom he soon quarrelled, and the two became life-long opponents upon questions of Church ritual and doctrine. Archbishop THOMSON worked his own way to prominence, starting life as a small tradesman, obtaining a scholarship at Oxford, and finally gaining the notice of Prince ALBERT and the Queen through his text-book on logic and his *Aids to Faith*. The archbishopric was given him when he was only forty-five years old. He was one of the finest preachers in the English Church.

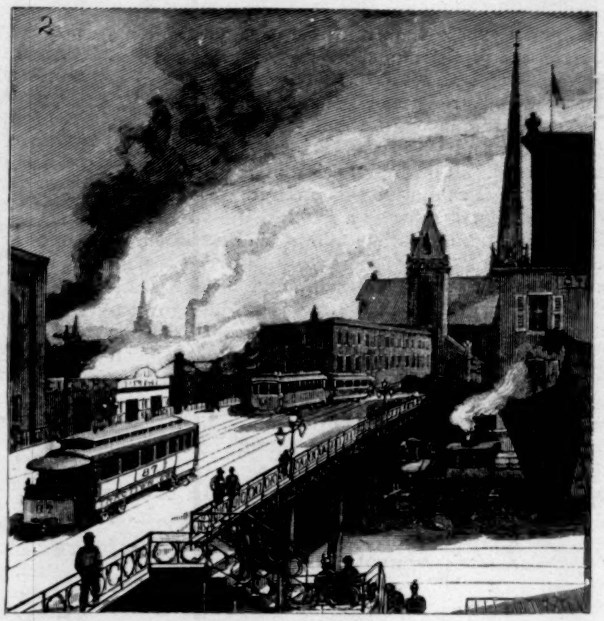
—JOSEPH DONOGHUE, of Newburgh, New York, who is the champion amateur skater of America, and has recently defeated the cracks of the world in contests in Holland and Sweden, is twenty years old, and comes of a family of skaters.

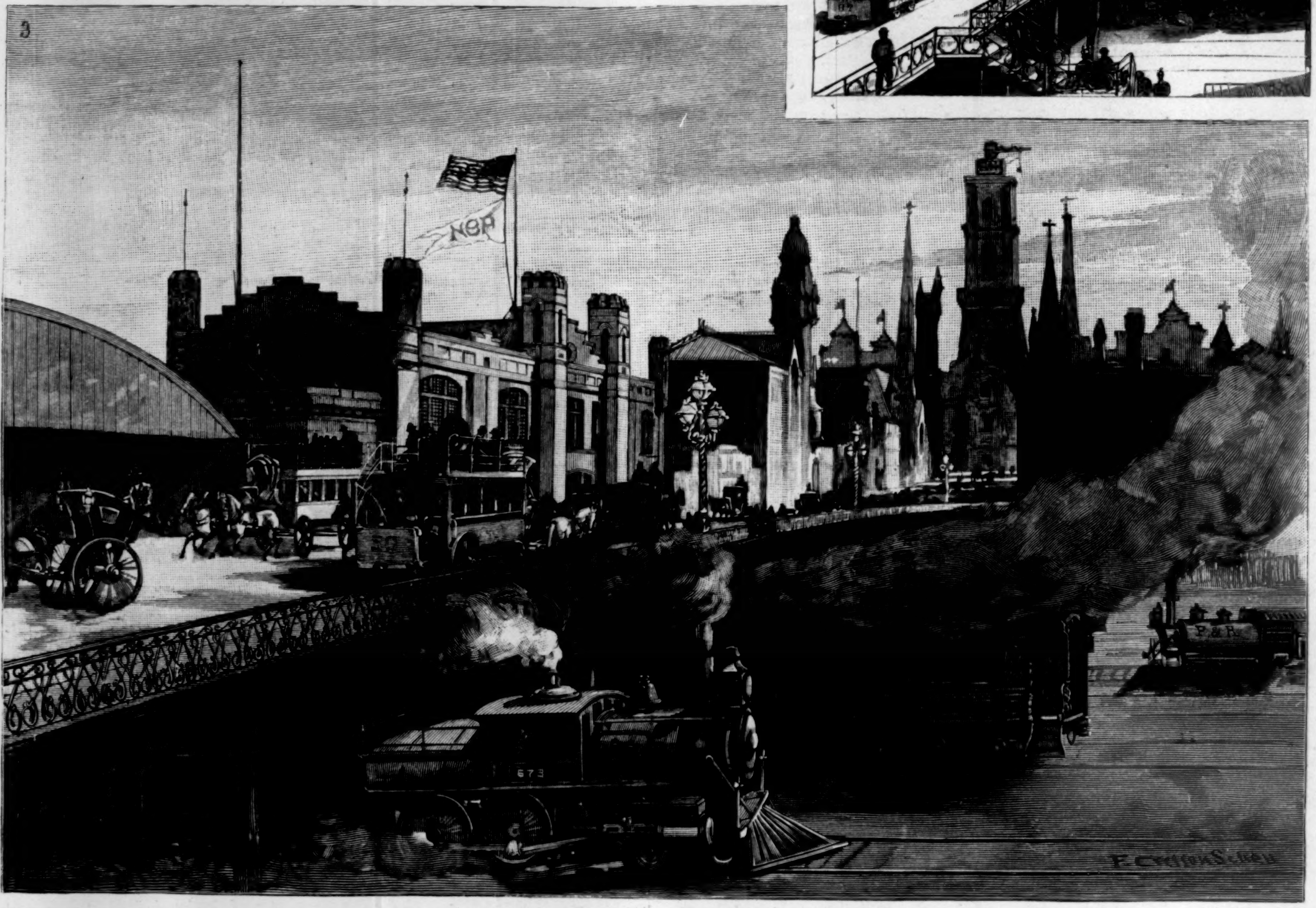
—JAMES GARFIELD, the second son of President GARFIELD, has just been married at Chicago to Miss HELEN NEWELL, daughter of JOHN NEWELL, President of the Lake Shore and Michigan Railroad. Mr. GARFIELD was graduated with his brother HARRY at Williams College in 1885, and the two now form the Cleveland law firm of GARFIELD & GARFIELD. The younger of the brothers possesses many of his father's mental and physical characteristics, and hopes in the near future to enter public life.

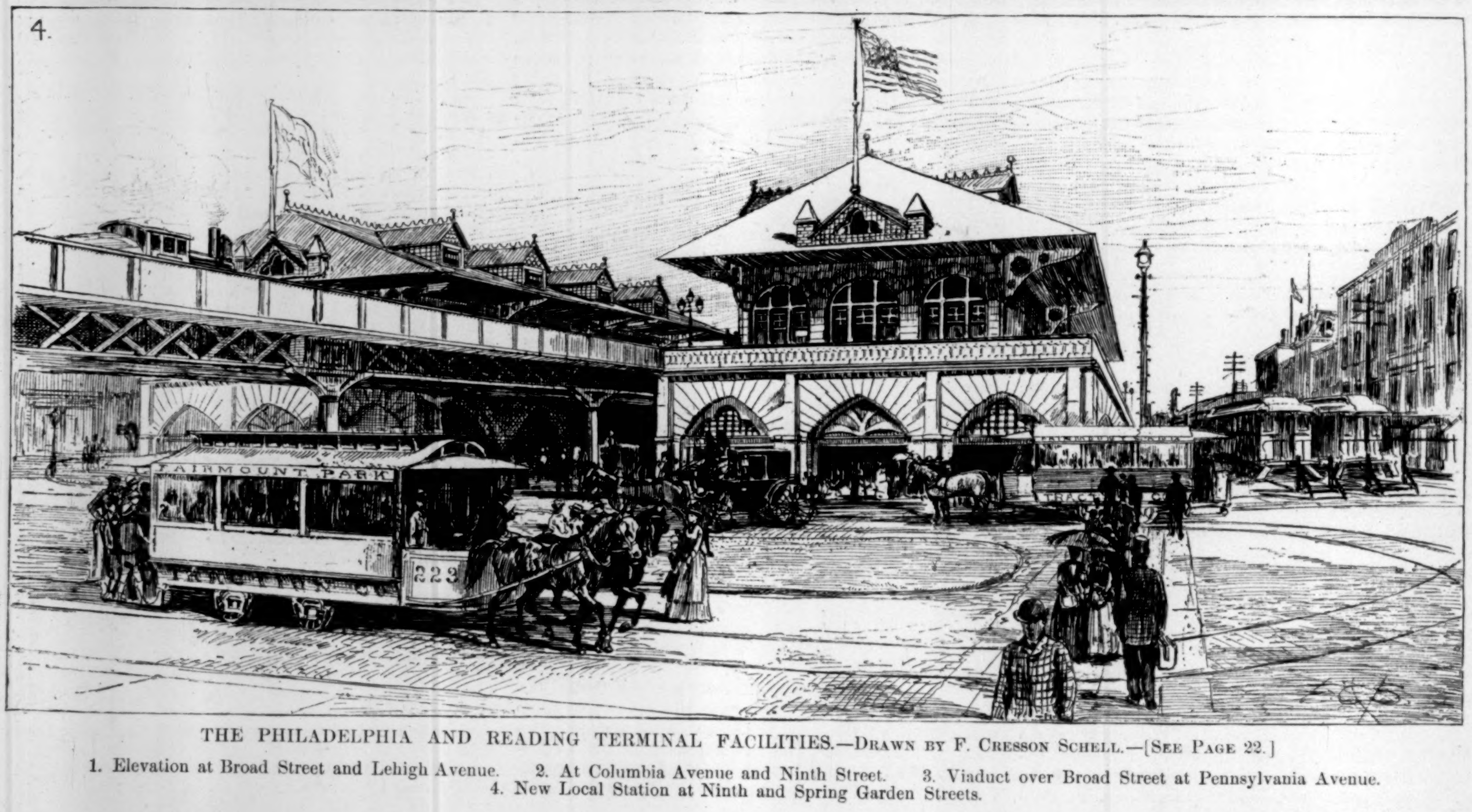
—The late OCTAVE FEUILLET, the French novelist and dramatist, was best known in this country by the dramatization of his novel *The Romance of a Poor Young Man*, although he was a prolific writer of successful plays and a constant contributor to the reviews and papers of Paris. He was a member of the French Academy and an officer in the Legion of Honor.

—One of royalty's especial favorites in Europe is Dr. THOMAS W. EVANS, the famous American dentist in Paris, whose successful practice of his profession has enabled him not only to amass a large fortune, but also to secure the friendship of many prominent personages. The fact that he helped the Empress EUGÉNIE to escape from Paris after the fall of the Empire is a matter of history, but it is not so generally known that his acquaintance with NAPOLEON III. began while the latter was merely a claimant to the throne of France, and that the Countess of Montijo was introduced to her future husband through the doctor. Dr. EVANS has an intimate as well as a professional acquaintance with the reigning families of Europe, and, being called in as a friend when the Crown Prince FREDERICK, of Germany, was taken to San Remo, made the silver tube that was used in prolonging the Prince's life after the operation of tracheotomy had been performed. Over two hundred orders, including nearly all the leading ones, have been conferred on the doctor, and his house contains many other evidences of the gratitude and esteem of his royal patients and other friends.



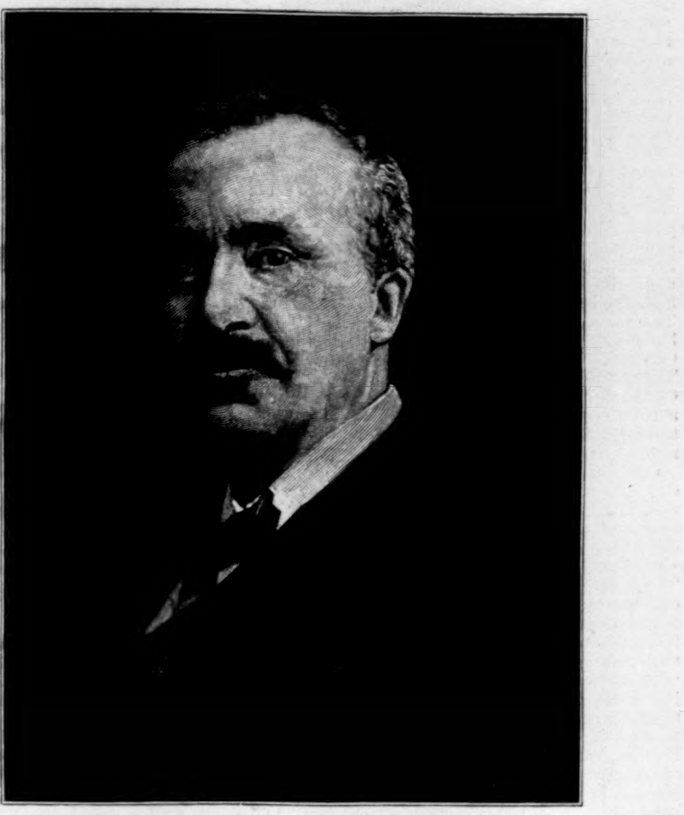






THE PHILADELPHIA AND READING TERMINAL FACILITIES.—DRAWN BY F. CRESSON SCHELL.—[SEE PAGE 22.]

1. Elevation at Broad Street and Lehigh Avenue. 2. At Columbia Avenue and Ninth Street. 3. Viaduct over Broad Street at Pennsylvania Avenue. 4. New Local Station at Ninth and Spring Garden Streets.



THE LATE DR. HEINRICH SCHLIEMANN.

ALEXANDER HARRISON.

ALEXANDER HARRISON, one of the most distinguished of American artists, is of New England stock, belonging to the Connecticut branch of the family, but was born in Philadelphia. The date of his birth is January 17, 1853, and he was christened Thomas Alexander. He began the study of art while an aid on the United States Coast Survey, and worked from time to time, as his regular duties permitted, in the studio of the portrait-painter George Pettit, in Philadelphia. Leaving the government service, he entered the San Francisco School of Design, and studied there for about fifteen months, at the end of which time—in 1879—he went to Paris. He became a pupil of Gérôme at the École des Beaux-Arts, and first exhibited at the Salon in 1880. In 1882 he sent to the Salon his well-known picture called "Castles in Spain," which attracted a great deal of attention, and he has been a regular exhibitor ever since, "Le Crépuscule," "La Vague," "Arcadie," and "Une Rivière" being his greatest successes, and the pictures which have in great part made for the artist the international reputation he now enjoys. At the Universal Exposition at Paris in 1889, Mr. Harrison was represented in the American Section by a number of his most important works, and was awarded a medal of the first-class by the jury, and from the French government the decorations of Chevalier de la Légion d'Honneur and Officier d'Instruction publique. At the new Salon this year, called the Salon du Champ de Mars, at which Meissonier is president of the jury, and many of the leading artists of France are exhibitors, Mr. Harrison was appointed a member of the jury, and achieved a remarkable success with the exhibition of a number of his most recent works. He came to New York in the summer of 1890, and spent some months painting landscape and sea-shore motives at Newport and Easthampton. He has a studio this season in the city, and means to stay until early spring, when his affairs will call him back to Paris.

Mr. Harrison is often spoken of as a "marine painter," but he should not be thus narrowly denominated, for though some of the best of his works are pictures of the sea, he treats landscape motives quite as often, and one of his most celebrated works, "Arcadie," is remarkable as a study of the effect of outdoor light on nude figures. At the recent exhibition of his work in New York, which included, besides a dozen important compositions, a large number of landscape and sea studies, there was nothing more interesting and characteristic of his methods in painting than some studies of nude figures in out-door light. These are painted with great truth of observation as to values, and with an apparent purpose to obtain as much of the charm of nature in color effect as possible. It may justly be said of Mr. Harrison's work in general that he prefers to sacrifice form to color if he cannot always get both, and it is as a colorist chiefly that he makes the strongest claim to our consideration. This is especially true of the "Arcadie," in which, though the landscape is very well drawn, and delightfully true in effect as well, the charm that lies in the painting of the nude figures does not come from elegance or grace of line, but from just observation and rendering of subtle color values. The picture is one that possesses very great charm, and yet the figures are not in themselves beautiful, except in the sense that they are in harmony in the color scheme of the composition. The great merit of this work is its admirable *ensemble* and its remarkable truth to nature. But though it is true that Mr. Harrison paints many other things than the sea, it is also true that it is in pictures of the sea that he has done his completest and best work. "Le Crépuscule," exhibited at the Salon of 1885, and now in the galleries of the museum at St. Louis, a wonderful picture of the ocean rolling inshore in long, gently breaking waves under an effect of twilight, with the full moon rising; the "Open Sea," a simple composition of the sky and the water moving slowly and grandly in long glassy billows—a most admirable picture of the sea, and one that fitly depicts its sublimity; and "La Vague," which resembles "Le Crépuscule" in composition, but is painted under an effect of full daylight—are the best of the sea pictures that have been seen in this country, at least, and they are certainly the ones upon which Mr. Harrison may most safely depend to justify his high reputation as a painter of ability in technical achievement, and as a man of the most distinguished artistic temperament. Among his fellow-artists, both in France and America, his talent is fully recognized, and his diligent study of nature and earnest search for truth, so apparent in his works, are generally commended. The individuality of his work is one of its chief merits; and without being what may be called popular with the public, it is so highly appreciated by amateurs that Mr. Harrison may be considered as one of the most successful of American artists.

WILLIAM A. COFFIN.

DR. HEINRICH SCHLIEMANN.

THE world of scholarship mourns the loss of an extraordinary man, to whom it lies under the greatest obligations, in the death of the Greek archæologist Dr. Heinrich Schliemann. As an example of what is as near as is humanly possible to the solution of an impossible problem—lifting one's self by the boot straps—Dr. Schliemann's career is a shining picture. At seventeen a grocer's lad peddling sauer-kraut and herring in a petty German town; at forty-one a retired merchant of princely wealth, whom the most prosaic of trades had not prevented from becoming a linguist of polyglot accomplishments, a scholar so admirably equipped that ordinarily a life of exclusive devotion to study would scarcely have overshot his mark, an enthusiast burning with zeal toward a venture which belongs to the most poetic and romantic side of erudition, and yet a man of affairs with so much genius for business that he had amassed a great fortune from nothing in a score of years. Dr. Schliemann at the parting of the ways strikes the imagination even more than when he had reached the ripeness of his fame.

Heinrich Schliemann, who died at Naples, Italy, on the day after Christmas, of abscess on the brain, was born at Ankershagen, in Mechlenburg, in 1822, the son of a poor Protestant pastor. Hence he inherited the tastes of the scholar, and was fed on wholesome mental pap by a father who loved history and the classics even more than he did theology. The stories of Herculaneum and Pompeii and the deeds of the Homeric heroes were recited to the youngster from the time that he was freed from pinafores. As he grew older his avidity of reading, specially in the Homeric section of Greek history and life, pointed to university distinction, perhaps to a professorship, the goal for which the well-regulated German mind naturally yearns. Even as a lad, the great archæologist that was to be insisted that the remains of ancient Ilium must still exist, buried under the dust of ages, so keenly was his imagination stirred. This thought remained the beacon of his life through all the days of poverty and hard work. When Father Schliemann fell on evil days, the *res angusta domi* made it necessary that the ardent boy should become a grocer's apprentice instead of going to the university. At this ungrateful work he remained till he was nineteen years old, when, being wrecked on a voyage for which he had shipped to a Venezuelan port, he was stranded, sick and helpless, in Amsterdam. Here he obtained employment finally with a merchant, F. C. Quien, and devoted himself with equal assiduity to making out invoices and acquiring languages, a talent for which had begun to show itself. In two years he had learned to speak and write English, French, Dutch, Spanish, Italian, and Portuguese, in addition to Latin, which he had learned from his father. His study of Russian was the corner-stone of his fortune, as it led to his being commissioned as the agent of the mercantile house of B. H. Schraeder & Co. at St. Petersburg. At the Russian capital he soon acquired a business of his own, and began to amass wealth rapidly. He continued to add to his linguistic learning, mastering Swedish and Polish, the modern Greek or Romaic, and ancient Greek. It is said that he acquired a good speaking knowledge of Romaic in six weeks, with the help of two friends from Athens, and in three months further he so far conquered the ancient Greek that he could read the classics with considerable facility. The young merchant's memory had always been extraordinary, and his incessant practice so cultivated the faculty that he could acquire and retain a new vocabulary with the greatest ease. The circumstances of the Crimean war, which opened fresh fields for speculative enterprise, enabled Schliemann to augment his fortune rapidly, and in the year 1858 he was worth nearly half a million dollars. His Hellenic passion had grown with his wealth, and he now knew the Iliad and Odyssey almost by heart, besides having dipped deep in that cyclus of studies which has chrystallized around the core of Homerism. In 1858-9 he travelled extensively in Sweden, Denmark, Germany, Italy, Greece, Asia Minor, Syria, and Egypt, and added Hebrew and Arabic to his gift of tongues.

In 1863 Schliemann retired from business with a fortune, it is said, of about £10,000 a year, and the serious labor of his life, for which all else had been preparation, began. He was now ready to begin the task which had shone before him as his life's ideal—the rescue of the credibility of the Homeric Epos and its associated legends from the contempt heaped on them by what he considered the hypercritical edge of nineteenth-century scholarship; this rescue, too, he would effect by purely scientific agencies. After an extended journey around the world he settled in Paris, and passed through a scientific study of methods in history and archæology under the distinguished Buele. Here, in 1869, he published his first book, *Ithaque, le Péloponnèse, et Troie*, describing his travels in 1868 in Corfu, Cephalonia, Ithaca (where he fancied he had found remains of the home of Ulysses), and the Peloponnesus, and describing the Cyclopean remains of Argolis and the topography of the Troad. The significance of this book was its refutation of the theory of identity between the modern Bounarbaschi (χώμη Ἰλιέων, "the village of the Ilians" in later Greek times), and the site of

ALEXANDER HARRISON, THE AMERICAN ARTIST.—DRAWN FROM LIFE BY W. T. SMEDLEY.

ancient Ilium. He advanced the theory that the high plateau of Hissarlik concealed the ruins of the city of Priam and Hector, and that the true site was that afterward baptized Ilium Novum, founded 700 B.C., 484 years after the complete destruction of Homer's city. In the beginning of 1870, Schliemann, accompanied by the Greek wife whom he had recently married, an accomplished lady who shared his enthusiasm, returned to the Troad under a firman from the Porte, and continued his excavations at Hissarlik during a period of two years, with but little interruption. He conducted his work with 150 men, and unearthed vast quantities of arms, ornaments, household utensils, vases, etc., in materials of bronze, gold, silver, copper, and iron, besides remains of walls, temples, and edifices, and what he claims to have been Priam's palace. His record of these researches was published in 1874, under the title of *Troy and Its Remains*, a book which at once initiated a bitter controversy, still being waged. He found the ruins of five different cities in his excavations at Hissarlik. It was the second city, about forty feet below the surface, which Dr. Schliemann identified with the Troy of Homer. He returned to Athens, and presented the results of his investigations to the Greek government, and thence proceeded to Italy, where he spent a little time in making studies of the ancient Etruscan civilization. He found himself once more in Greece the same year, and he now gave his attention to excavations on the site of ancient Mycenæ, the city of Agamemnon, which he pursued for several years. His first love drew him back in 1878-9, and he resumed his researches at Hissarlik, making the further discovery of a sixth subterranean city. His revised conclusions were given to the world, under the name of *Ilios, the City and Country of the Trojans*, in 1880 (published in the United States by Harper & Brothers).

To return to Schliemann's work at Mycenæ, which was begun in 1874, he unearthed what he supposed to be the tombs of Agamemnon and other early Argive kings, and a great treasure-house containing gold and silver images and ornaments in profusion. The archæologist, who was a strict constructionist of the Hellenic legends, believed that he had found the places of sepulture wherein had once lain the bodies of the great Greek king and his companions slain by the murderous wrath of Ægisthus. He also made important researches at Tiryns, another city of Argolis, famous for its Cyclopean walls and the fabled capital of Perseus. In 1877 was published *Mycenæ, a Narrative of Researches and Discoveries at Mycenæ and Tiryns*, and to the volume was added an introduction by Mr. Gladstone, whom Dr. Schliemann had met the year before during an English visit, wherein the most brilliant honors were showered on him. In 1882 his steps were once more drawn to the Troad, and his further researches in this fascinating region were embodied in the book of the following year, entitled *Troja; Results of the Latest Researches and Discoveries on the Site of Homer's Troy*, etc. (published in the United States by Harper & Brothers). This contained an elaborate preface by Professor A. H. Sayce; and it may be said, in passing, that its predecessor *Ilios* was also honored by preface, notes, and appendices by such famous scholars as Professors Rudolf Virchow, Max Müller, A. H. Sayce, J. P. Mahaffy, H. Brugsch-Bey, M. E. Burnouf, and others scarcely less noted. All of these had been drawn into the "war of Troy," and it is honorable to the fame of the great archæologist that such authorities should have in such large measure defended the substantial truth of his more important contentions against the attacks of Boetticher, Brentano, and others. While it cannot be said that the consensus of contemporary scholarship sustains all of Dr. Schliemann's views, there is a growing tendency to accept much which was scoffed at only a few years ago.

The latter part of Schliemann's life was spent at Athens, where he built an almost princely residence, and dispensed a princely hospitality to visiting scholars from all parts of the world. He was a member of many learned societies, and a D.C.L. of Oxford University. In addition to the works already cited, Dr. Schliemann's literary remains include *Travels in the Troad*, and a work on China and Japan. During the year preceding his death he had been engaged in excavations on the Acropolis at Athens, and had also pushed further researches at Hissarlik. Dr. Schliemann spent several years in the United States during the period of the late civil war, as his investments were largely in this country, and he is reputed to have built the first fire-proof structure erected in Sacramento.

SUPERINTENDENT OF POLICE WILLIAM MURRAY.

It is not to be expected that the greatest city in America should have at the head of its police force a man who is not in the largest sense capable in the discharge of any and every duty that may fall to a policeman. Such a man, as has been amply proven by more than twenty years of experience, is William Murray, Superintendent of the police force of New York city. A little less than forty-six years old, he is still in the prime of manhood, and though not a giant in size, he is one of the best athletes in the city, allowing nothing to interfere with his perfect physical condition excepting, on occasions, the performance of extraordinary duty. During the great car strike, when from 4 A.M., January 29th, till 8.15 P.M., February 7th, he never left his office for a moment, he was practically without sleep, yet on the last day he was as alert, as clear-headed, and as vigorous in the direction of the warfare he was carrying on as he was at the beginning of this tremendous feat of endurance. It may be mentioned as an illustration of his character that will be appreciated by every smoker in the world, that having quit smoking at the beginning of the year, he did not put a cigar in his mouth during all these sleepless hours.

Concerning his personal appearance, the accompanying portrait will give the best possible testimony when coupled with the statement that he is of somewhat more than average height, but is so broad that when standing alone he gives the impression of being rather under than over the average size. His face is a capital index to his character. Intellectual, kindly, and bland in the extreme, he is at the same time stern and unrelenting in his pursuit and punishment of evil-doers. An instance of this was his prompt action when the policeman Connors was arrested in the act of burglary. The Superintendent personally cut the buttons from the uniform coat of the offender, and by pushing the prosecution himself, had the unhappy man convicted, sentenced, and on his way to Sing Sing within twenty-four hours of his arrest. Commanding, as the Superintendent does, what is probably the best-organized and best-drilled small army in the world, he has need not only of all soldierly qualities, but, considering the nature of his duties, he has to be also a good lawyer and a practically efficient citizen at once.

William Murray was born in New York city, of American parentage, and was educated in the New York common schools. At the outbreak of the war, in 1861, he was not quite eighteen years old, but he enlisted in the Ellsworth Fire Zouaves, and took part in the first battle of Bull Run. He was saved from the necessity of joining in the retreat by the fact that he was wounded severely in the thigh, and left on the field of battle. The recovery from the wound was tedious, and he was incapacitated for many months. After the war, Murray returned to New York, and applied for a position on the police, and was appointed patrolman in May, 1866. He was not at that time required to pass a civil service examination, but nineteen years later, when he had climbed through the various grades of promotion, and had to pass this examination in order to attain the rank of Superintendent, he received from the examining board a certificate showing that he had passed through the ordeal with a credit of 100 per cent.

It does not seem like specially rapid promotion, though many men serve more than nineteen years on the force without attaining high rank. Murray, however, was marked for special duty from the time he entered the force. In the old days—some twenty years ago, and even later—political influence had much to do with the New York police force. Indeed, it is only lately that the department has been superior to it, but Policeman Murray, from the time of his appointment until now, has never been credited with an ounce of power of this kind to advance his claims. His great intelligence, perfect coolness, and admirable judgment, however, commended him always to his superiors, up to the time when he received his appointment as Chief, and have been even more conspicuous since.

Beginning as patrolman, he was assigned to special duty almost constantly by Lieutenant Greer, then in command of the Third Precinct, and in that capacity he took the first steps in the career which has culminated in the most brilliant record of any policeman who ever served on the New York force. He was made roundsman in October, 1870, and in a little more than a year thereafter was promoted to a Sergeantcy. In 1876 he became a Captain, in 1877 an Inspector, and in 1885 he succeeded the veteran George W. Walling as Superintendent. It is said of him that in his twenty-three years of service he has personally secured the conviction of criminals for a greater aggregate term of service than any one else ever did. While he was Captain he personally arrested criminals whose terms added together made between 400 and 500 years. It is to be said, to the credit of the administration of the department, that this fact of unusual service has been the power that compelled Mr. Murray's constant promotion. He has commended himself always to those who came in contact with him as a man who was fitted for high position. He was a junior Captain when he was made an Inspector; he was a junior Inspector when he was made Superintendent; and he was the youngest man ever appointed to either position—Inspector or Superintendent.

Among the notable feats he has performed it is only necessary to specify a few. While patrolman he captured a masked burglar, one Jake Jerolomen, who had terrorized, nearly killed, and successfully robbed a family named Ward near Newark; and he detected and arrested one Worth, the most notorious safe burglar of his day. On Christmas night in 1876 the house of a rich man in Astoria was entered by a gang of masked burglars, who succeeded in getting away with a large amount of money and jewelry. They escaped unidentified, and committed robbery on the highway while going to the boat that took them away. No clew was apparent; but two days later a pencil-case was in Captain Murray's hands which had been pawned by some unknown man. It was a part of the proceeds of the robbery in Astoria. It was the first and only clew. Within a few days the four men who had been in the gang had been arrested by Captain Murray. They were convicted, and sentenced to an aggregate term of ninety-three years. Matt Dancer, a famous and wealthy gambler, who lived with his sister and niece in West Eleventh Street, was robbed one night in 1877. The thieves took away $200,000 in money and United States bonds. There was said to be no clew to the robbers; but Captain Murray discovered and arrested them, and recovered one-half the booty. Thomas Belton, a trusted employé of H. B. Claflin & Co., stole about $50,000 worth of needles, carrying them away under his clothes from day to day. He was detected and arrested by Captain Murray.

Other safe burglars were detected by him, and his services in the arrest of one who had robbed a jewelry firm in Maiden Lane were so conspicuous that the jewellers of the city clubbed together, bought a watch and chain valued at $1000, and presented them to him. The jewellers, however, have not been the only ones in the community who have testified to their appreciation of the services of this gallant public officer. The Society for the Prevention of Crime have presented him with engrossed resolutions telling their opinion of him as an official who has done more than any other to maintain public order and to repress crime in the city. Monsignor Preston, Vicar-General of New York, has officially thanked him for his good work. Major-General Hancock did the same thing in an official report that he made concerning the extraordinary pageant which attended the funeral of General Grant.

Mr. Murray was then Superintendent, and it was not until he was Superintendent that he had an opportunity to effect the reforms that he had been studying for years. He lost no time, though, in ordering changes when he was in the position to do it. His belief was that the power of a department like that of the police should be centralized. One of his early orders, therefore, deprived the Inspectors (his seconds in command) of their personal staffs and their outside offices. Each Inspector before that had had a head-quarters for his district, and had commanded a personal staff of sergeants, roundsmen, and patrolmen. The new order relegated these men to patrol and desk duty through the department, and brought the Inspectors back to Head-quarters to act as the personal staff of the Superintendent. It was a radical change, and the result has been satisfactory. He has insisted upon the highest grade of discipline ever known in the department. No member of the police outside of the detective force is allowed now to appear at Head-quarters excepting in full uniform. He has established a Bureau of General Information at Head-quarters, at which information may be obtained any day concerning any person who may have been taken to a hospital, arrested, found dead, or in any other way come under the notice of the police up to 6 P.M. of the preceding day. With a disregard of "the power of the press" never shown by any of his predecessors, Superintendent Murray has ordered that such information shall not be given to the newspapers for publication excepting in cases where it is of public service, and he has had sufficient nerve to maintain this order in spite of the protests of some of the daily papers.

His actual service as Superintendent embraces numerous reforms, which he has carried out without regard to the pressure that politicians and "men about town" have sought to bring to bear. In enforcing the excise laws he has been especially vigilant. He says: "I have nothing to do with making the laws. I am here to enforce them." Every New-Yorker knows that the excise laws are constantly violated, and that a perfect enforcement of them is wellnigh impossible. Under three and a half years of Superintendent Murray's tenure of office, however, there have been over 15,000 arrests for violation of these laws, as against less than 6000 arrests in the same length of time before he came in power. He pays attention to the minutest detail of municipal law, and does not hesitate to call his Captains together at any time, and warn them that they must enforce regulations as to ash barrels on the sidewalk, as to the personal appearance of their men, as to the excise law, as to gambling-houses, as to reckless driving, as to pool sellers—as to everything, in short, that comes within the purview of a vigilant policeman.

It is, however, in command of the department in times of public disorder that Superintendent Murray displays those qualities that most attract public attention. In 1877, as Inspector, he headed personally a force of 500 policemen, and attacked a mob of socialists who undertook to march from Tompkins Square to Broadway without the permit to parade which the law requires. It is by no means certain that disaster would have followed the parade, but, as a policeman, Inspector Murray was not looking at the results. He was dealing with the present facts, and his prompt and decisive action was credited with saving the city from riot and pillage.

No considerable disorder occurred in the city between 1877 and 1886, when the car drivers and conductors went on what they still call the long strike. It is certain now that the great body of them intended no violence or public disorder; but they were excited, and many who personally would have maintained the peace were incited by a few hot-headed ones to riotous behavior. The duties of the police were delicate and arduous. They stood between capital and labor to keep the peace. When the car companies endeavored to run their cars, and demanded protection from riotous strikers, the police gave it; but they were specially prohibited by the Superintendent from doing anything that would justify a claim by the strikers that their work was performed by the public servants. This order was obeyed with admirable judgment by the perfectly drilled policemen, and was enforced by Murray's personal supervision. For some seven weeks the trouble continued, and during all that time cars were run with policemen on board to protect them; but no policemen assisted in the driving or in the work of the conductors.

It was while this strike was going on that Superintendent Murray thought out the plan which he put in operation in the strike of 1889, and by which he was able to provide for the extra duty without calling on his men for any extra work. As he said himself, the strike could have continued indefinitely without necessitating the performance of one hour of extra duty by any policeman excepting himself and his Inspectors. It was a simple plan. He put one-half the force on "strike duty," and kept the other half on regular patrol duty. No better plan seems feasible, but the fact that this is necessary gives point to the urgent recommendation which Superintendent Murray made in his report on the strike to the Commissioners, that the police force be increased by at least 1000 men. The possibility that the regular duty of the force may at any time devolve upon one-half the men is not a pleasant one for property owners to contemplate, especially when the fact which necessitates the move is that disorder and riot are imminent.

It would be manifestly unfair to Superintendent Murray's predecessors and to the other officers of the force to give him sole credit for the condition and *morale* of the New York police, but it is entirely true that under his command the force has reached a much higher point of efficiency than ever before. It is unquestionable that there is much less open vice and violation of law in the city than was ever before known, and that this fact is owing chiefly to the Superintendent's personal vigilance and the discipline he maintains.

Personally he is not only respected and feared by his men, but is greatly loved and admired by them all. Although he is implacably stern when occasion demands it, he was never accused of injustice or harshness, and was never known to show the least sign of excitement. Easy and polished in demeanor, he never raises his voice above conversational tones, never refuses to listen to any reasonable appeal, and is known to his subordinates as a man of princely generosity. There are few men on the force who would not follow him, where he has never hesitated to go, into imminent peril of death in the performance of duty.

THE PHILADELPHIA AND READING TERMINAL.

Rapid transit—or, perhaps, to speak more properly, inter-urban transit—is a municipal spectre which confronts all our large American cities. In New York the elevated roads are mere apologies for rapid transit, or any other kind of transit, if ill-ventilated, overcrowded cars and dilatory train service are any criterion of what the public has a right to expect in return for the vast privileges enjoyed by these corporations. In Boston they have recently connected the outlying suburbs by overhead electric railways, which does not solve the problem, but merely shelves it until some future day. Chicago has her "Alley Road," which may help the south side a little; but the north side, and particularly the west side, where more than one-half of Chicago lives, are both without any more real rapid transit than what the surface cable roads afford. With the World's Fair city the question is what to do with the Chicago River, and it has so far remained unanswered. In St. Louis there has been some talk of an elevated road, but it has ended in talk, either from a lack of enterprise or a genuine lack of necessity, most probably the latter. Brooklyn has naturally copied New York. Philadelphia, the last of our large cities to attempt some form of rapid or inter-urban transit, has been and is yet confronted by a more difficult series of obstacles to a proper solution of this truly momentous question than any other of her sisters. In 1854 the Assembly (as it was then called) of Pennsylvania passed the act of consolidation, by which these corporate townships and boroughs of the county of Philadelphia became part of municipal Philadelphia, viz., Germantown, Southwark, Bristol, Manayunk, Roxborough, Northern Liberties, Byberry, Penn, Oxford, Kingsessing, Belmont, Moreland, Kensington, Richmond, Spring Garden, West Philadelphia, Passyunk, Lower Dublin, Blockley, Moyamensing, Frankford, Bridesburg, White Hall, Delaware, and Aramingo. At that time the question of rap-

id transit was not born; and yet from that period the difficulties of the present situation may be said to date. By the existence of all these unconnected settlements the city inherited a number of lax railroad concessions, which have with the lapse of time blossomed into downright nuisances, prejudicial to the lives and comforts of its citizens. In those days all of the unsettled portion of Philadelphia County consisted of truck farms, through which the iron horse ploughed his way unrestricted by the crossing of streets at grade, hundreds of which since then have come into existence upon the city map. The railroads then, as now, entering the city were the Philadelphia, Wilmington, and Baltimore, with its station at Eleventh and Market streets (in 1854 sold to the Pennsylvania Railroad, the Philadelphia, Wilmington, and Baltimore moving to Broad and Prime streets, for years the only decent passenger station in the city), Philadelphia and West Chester, Philadelphia and Trenton (now all leased lines of the Pennsylvania Railroad), and the main line of the Pennsylvania itself; besides these were the Philadelphia and Reading main line, and the Philadelphia, Germantown, and Norristown, and North Pennsylvania Railroad (for several years leased to the Philadelphia and Reading company). The city of Philadelphia covers nearly 130 square miles of territory—a greater area, probably, than any city in the world; and the heart of the town being then, as now, in the immediate neighborhood of Broad and Market streets, the railroads sought to come as close to this centre as possible.

Before the Pennsylvania passed from the hands of the State to its own control its first passenger station was at Third and Dock streets, then at Eighth and Market, and from there locating at Eleventh and Market, the site of the present Bingham House, and its freight station was where stands to-day Mr. Wanamaker's Grand Depot, with its 5000 employés. The West Chester had its first depot at Broad and Race streets, where the building long known as the "City Armory" stood, now the armory of the battalion of "State Fencibles"; afterward the West Chester and Philadelphia moved to Eighteenth and Market, and later yet to Thirty-second and Walnut. The Philadelphia and Trenton at first came no further than Tacony, but finally removed to Front and Harrison streets, Kensington, from which station some local passenger trains are yet despatched. Reading brought her main line across the Schuylkill at Belmont, around the Park, and down Pennsylvania Avenue to Broad and Callowhill streets; Philadelphia, Germantown, and Norristown, starting at the latter place, extending through Germantown from Chestnut Hill, and a branch to Manayunk, Roxborough, and Norristown, gridironed the city and county by way of Ninth Street to that avenue's junction with Green Street, where stands its present passenger station.

The North Pennsylvania eventually established itself at Third and Berks streets, then out "in the bush." In shape, Philadelphia resembles as much as anything the average sweet-potato, with its narrow end extending to League Island on the south, and gradually widening north and west to meet the boundary lines of Montgomery and Delaware counties. Through this broad end came tearing down toward the heart of the city the railroads, every year adding to the streets which they crossed at grade, and those which the city's growth added crossing the railroads at grade. Every year added to the manufacturing greatness of the Quaker City, and naturally along the lines of these ironed roadways the great foundries, mills, and factories established themselves, with sidings connecting them at grade with the great trunk lines that furnished them with transportation for their wares to all parts of the Union; and about its manufacturing industries grew up a city of a million of people. It soon became a question how to handle these people, how to transport them to their homes; and the inter-urban traffic of the railroads grew to enormous proportions. The names of most of the townships and boroughs before mentioned now appear upon the railroad map of the city as prominent inter-urban points yet part of the municipal whole.

Rapid transit first came to the front in the Quaker City some six or seven years ago, through the activity of the late Hon. George H. Boker and his associates, who made several unsuccessful attempts to pass an ordinance through the City Councils granting permission to erect upon Market Street, from the Delaware to the Schuylkill, and thence beyond to a point in Delaware County, an elevated road on the New York principle, but such was the popular indignation, the attempt signally failed at each trying. This agitation brought into existence the Traction Company, who sought by their cable system to furnish the necessary rapid transit; it improved the situation, but it far from cured the evil. When the Pennsylvania people crossed the Schuylkill and built a stone viaduct over their own property to Broad and Market streets, built a road of their own Germantown way, another to tap the Schuylkill Valley, acquired the Philadelphia, Wilmington, and Baltimore, and also Philadelphia and West Chester, and centred all these roads, with their fine suburban homes, at the City Hall, Reading's main stronghold was invaded, and a serious blow struck at her interests. Reading tried to counteract these proceedings by leasing the Germantown road—the North Pennsylvania—and securing control of the "Bound Brook Route" to New York; but in the mean time Reading became a financial wreck, and passed into the hands of a receiver. Then came plans of reorganization, and this was finally effected after a desperate and protracted legal battle. When this was ended, Mr. Austin Corbin became its president. As soon as the financial atmosphere had been sufficiently cleared, Mr. Corbin began to lay plans for centralizing his passenger business, then divided between three terminals. The natural objective point was Market Street, and the centring point where all their lines could meet would be Twelfth Street. The first application was made for an elevated structure and a Market Street station three years ago. At once the question of abolishing all grade crossings leaped to the front; the citizens had suffered from this dreadful incubus for years, and here, thought they, poor deluded creatures, was the long-wished-for opportunity to get rid of them once and for all.

Reading occupies to-day at least ninety per cent. of all the grade crossings in Philadelphia, and, what is most to the point, it holds the right of way "at grade" in "fee simple," and cannot be dispossessed, nor compelled to vacate these grade crossings, nor to depress or elevate its tracks, except at its own sweet will. And this the Quakers soon discovered. The word terminal in this connection is somewhat of a misnomer; in point of fact, it is nothing more than a construction company, which the peculiar condition of the Reading Company's bonded and share capital made a necessity in order that the company could issue shares for their terminal project, and with the proceeds construct their road. The proposition of the Reading Company, which has finally become a law, is, in effect, that the road, as it runs down Ninth Street, shall be depressed so as to allow Broad Street and Lehigh Avenue to pass over its tracks; it will then proceed at its present grade until Columbia Avenue is reached, which will be carried over the railroad. The viaduct will leave the Ninth Street line at Fairmount Avenue two blocks north of its present Green Street station, rising at a moderate grade on solid masonry to a point just north of Green Street. It there passes to an iron construction (holding two tracks) diagonally southwest across the city, upon the company's own land—property bought and buildings demolished for this improvement. The viaduct as an iron construction extends to Callowhill Street, and thence to the new station at Market Street it runs on solid masonry. A little south of Callowhill Street a branch curves to the westward, crossing Twelfth and Thirteenth streets overhead, joining the surface tracks of the main line at Broad Street. All streets crossed above grade will do so by brick or iron archways having a clearance of thirteen feet above the pavement. The main line, which circles about the Park, crossing all the streets from Twenty-fifth to Broad at grade, connecting at grade with the Baldwin Locomotive Works, Bement & Miles Tool Co., the William Sellers Tool Co., the Whitney Car Wheel Works, and a dozen other important manufacturing interests fronting on and contiguous to Pennsylvania Avenue, will remain as at present, shutting off Fairmount Park and a beautifully and expensively built portion of the city by its girdle of iron tracks.

Where the main line crosses Broad Street, instead of elevating the tracks, the city has, marvellous to relate, consented to elevate the street, and a bridge, which can only be likened to the hump on a camel's back, will desecrate Philadelphia's one fine avenue and ruin it as a prominent highway forever. One of the adjoining buildings which this bridge will partially close up and wholly destroy as to appearance will be the armory of the First Regiment Infantry, the crack military organization of the Quaker City, and the only one possessing a really fine armory. But in these days of railroad gormandizing what can be expected? The city has not been able to dictate terms to the railroad; in fact its citizens, in spite of the battle they waged against grade crossings, were powerless to compel their removal. Of course it was possible to withhold any further concessions to the railroad, and for three years this was done, but the people gained nothing by it. They soon discovered that the railroad company held a winning hand, and thus gracefully succumbed. In spite of the fact that by this ordinance nine-tenths of the grade crossings are retained, the new passenger terminal is of inestimable benefit to Philadelphia, and, above all, of immense profit to the railroad company. The Reading Company, with its main stem of 93 miles, was originally projected with a view to the transportation of coal from the anthracite regions in Pennsylvania to tide-water; it has become now one of the most important carriers in the country. Including its branch lines, and acquiring by purchase or lease the lines of other companies, it operates 2210 miles of railroad, all terminating in Philadelphia. Regarded as a carrier of passengers, the Philadelphia and Reading is primarily and distinctively a local means of communication between Philadelphia, its suburbs, and the interior of the State. Of 18,000,000 passengers carried by it annually, upward of 10,000,000 arrive at and depart from Philadelphia; of these latter 80 per cent. are classified as *suburban travel*, consisting of passengers to and from points within a radius of 20 miles of the city. At their present station at Ninth and Green streets, 223 passenger trains arrive and depart daily, it being estimated that the intersection of Ninth and Wallace streets is crossed by an engine, with or without cars, 1000 times every 24 hours! Is it to be wondered that the citizens cry for a removal of grade crossings? The new terminal station to be erected at Twelfth and Market will occupy the property popularly known as the "Twelfth Street Market."

Most people—and those who are not are willing to be—are well acquainted with "Philadelphia butter, Philadelphia poultry, squabs," etc., and this market is head-quarters for these edibles. It looks as if the Reading people were going to have a complicated legal controversy before securing the condemnation of the market company's property; so it is now proposed to retain the market on the ground-floor, with the station proper overhead, connecting with the market by elevators. It is thought that the ease with which produce could be brought to the market from all parts of the territory, and the equal facility with which customers could reach it, would combine to make the market an exceptionally prosperous institution, and therefore secure the co-operation of those interested in the present markets in the advancement of the new arrangement. The station itself will be one of the finest railroad structures in the world. In the shed, and extending 500 feet beyond it, there will be 12 tracks, and every effort will be made to secure architectural beauty for the building, combined with comfort and security for the travelling public. It will have a frontage of 266 feet on Market Street, and the main building, containing the offices and waiting-rooms, will have a depth of 90 feet on Twelfth Street, the shed running through to Arch Street, making the entire structure 674 feet in length.

By the terms of the ordinance which calls into existence the Philadelphia and Reading Terminal Company, work is to be begun within 90 days, and the entire improvement completed within three years. The Philadelphia and Reading Company, as an evidence of good faith, is required to file a bond with the city in the penal sum of $1,000,000, and proper provision is also made for the settlement of consequential damages. It will be seen that from the first entrance of railways into Philadelphia the instinctive convergence of their passenger traffic was toward Broad and Market streets. Pennsylvania, and some of its allies, after the city compelled the removal of steam tracks from Broad Street and Market Street, moved across the Schuylkill to West Philadelphia, but returned close to their old homes at Broad and Merrick, opposite the City Hall. Notwithstanding the retention of so many of the grade crossings, and the danger to human life which they entail, with the completion of this new terminal, and the existence of the Pennsylvania's Broad Street Station and its probable further extension, Philadelphia may be said to have secured for her people almost perfect inter-urban transit, and, to a certain extent, also rapid transit. By these two great passenger stations, controlling almost absolutely the entire passenger traffic of the city, her travelling public will be landed at the very doors of her great commercial houses, close to her harbor, theatres, public buildings, and financial institutions, in less time and with more comfort and safety than in any other city in the United States. It is confidently predicted to mean a new Philadelphia.

HARRY P. MAWSON.

THE LAST STAND.

IN these days of Indian warfare in the Dakotas special interest attaches to Mr. Frederic Remington's masterly picture "The Last Stand," given in the present number of the WEEKLY. Its immediate story is vividly told to the eye, and the imagination supplies the sequel. The remnant of a body of United States troops, surrounded by an overwhelming force of hostiles, has been driven from point to point until all that remains for officers and men is to sell their lives as dearly as possible on the little hillock where they are brought to bay. The dead and dying, the acts of aiming and firing, show that the final moments are at hand, the enemy coming in from all sides. There is no sign of quailing in this party of doomed men; stalwart, stout-hearted, keen-eyed, these bronzed veterans will make the red warriors pay the full price for their victory. The last survivors will perhaps have a spare cartridge left, with which to save themselves from capture by a merciless foe.

How many scenes of which this is typical have been enacted on this continent, who can say? No one then is left to tell the tale. No one of Custer's command remained to narrate the massacre of the Little Big Horn. Contrasting the enormous power of the government with the resources of a single Indian band or tribe, it may appear that the struggle is always hopeless for the red man. Practically it always is so in the end; but before that end is reached the very nature of the warfare may put the troops at a disadvantage. The army is small at best, and a large part of it occupied with garrison duties that are not to be abandoned for Indian hostilities in a single locality. The Indians, too, in taking to the war-path, make for rough and desolate regions where campaigning is difficult, where any superiority in the government's military appliances is neutralized, where even its supply trains are hinderances, and perhaps sources of peril. Better armed, often, than the regular soldier, sometimes having two horses where the soldier has one, inured to hardship and to privation, active, brave, skilled in wood-craft, spending half his life on horseback, a good shot, the Indian is the ideal irregular cavalryman, especially where he chooses his own ground for operations. If he no longer has the buffalo herd for his commissariat, a substitute is furnished by the ranch of the settler, where he may find not only cattle for food, but horses for remounting.

Alarms here and there may compel the hurrying of forces to the relief of agencies or of settlers, and these columns then may run a risk of ambush, or of being confronted by the enemy in full force; or perhaps some sudden attack on a marching column is itself the first sign of an Indian outbreak. Sometimes, by dint of perfect skill and unflinching courage and endurance, troops thus surrounded may manage to keep off the enemy for days and nights till relief comes, as in "Forsyth's fight," that thrilling struggle of years ago, which General Sheridan styled "a close call"; or as in that dramatic incident of the last Ute campaign, which General Merritt more recently described in HARPER'S MONTHLY MAGAZINE. Sometimes, alas! help may come too late; and then the final scene is the pathetic and tragic one which Mr. Remington has depicted.

A DEFINITION.

A SECRET is a thing my friend confides to me,
Which I in turn confide to friends of mine, and they
Straightway to friends of theirs confide it, till we see
A secret really is as open as the day.

JOHN KENDRICK BANGS.

TORPEDO CRUISER NO. 1.

THE torpedo cruiser for which the bids will be opened February 11, 1891, at the Navy Department, is to be much larger than first-class torpedo-boats, and still retain many of their characteristics, such as great speed and quick manœuvring, to which will be added a steady gun-platform and great stiffness. She will be the first vessel of her class built for our navy. Her general dimensions are: length, 246.5 feet on deck and 259 feet on load-line, with 27.5 feet beam and 9 feet normal draft (8 feet forward and 10 feet aft). She is to have twin-screw propellers, driven by direct-acting, inverted, triple-expansion, four-cylinder engines of 3000 indicated horse-power each, with eight Thornycroft boilers for supplying steam. The whole machinery plant will only weigh 250 tons, which is much less than the ordinary weight required to gain such power, being only 83 pounds per I. H. P.

The hull is built with a double bottom, which extends under the magazines and machinery, and is framed on the longitudinal system, the transverse frames being 10 feet apart and the continuous longitudinal girders being 18 inches apart, which, taken with the bulkheads and protective deck, give great freedom from vibration due to the high speed of the engines. The protective deck extends the full length of the ship, sloping down to 2 feet below the water-line at the sides. The slopes will be $\frac{3}{4}$ of an inch and the flat deck $\frac{1}{2}$ inch. This covers the magazines, machinery space, electrical appliances, steering gear, and, in fact, all the vital parts, and with the coal that is stowed inside bunkers and the coffer-dams, will give such protection from the fire of guns, large and small, as can be given in a vessel of her high speed and displacement. She is to have a rudder of about 80 square feet area, actuated by direct-acting oscillating hydraulic cylinders, which will be capable of turning her around in about her own length—a necessary feature in this class of vessels, whose duty it is to catch and destroy the torpedo-boat flotilla thrown out by modern battle ships as skirmishers. Her lines are carried out both forward and aft beyond the deck to give an easy entrance and run, thereby making less disturbance in passing through the water at the speed of 23 knots.

The accommodations for officers and crew are large, and well lighted and ventilated, the galleys, lavatories, etc., being situated in a small house that encloses the machinery hatches on the main-deck. She has two masts, rigged fore and aft, and carries three powerful search-lights, besides a complete electric plant for interior illumination, running lights, etc. The battery consists of three 4-inch breech-loading rifles, four 6-pounders, four 1-pounders, and two Gatlings, being an exceptionally heavy battery for a vessel of this speed and displacement. At her normal draft she will carry 40 tons of coal, but has bunker capacity for a total amount of 190 tons, which will give her a steaming capacity of 920 knots at full speed, or 40 hours' steaming, and at 10 knots she can steam 14 days, or 3360 knots. In contrast with some of the similar ships built abroad, she will have a flush deck fore and aft, doing away with the poop and forecastle and correspondingly well, which will greatly add to her sea-going qualities, and make her a comfortable and dry craft. The vessel was designed by Chief Constructor Wilson, and her engines by Engineer-in-chief Melville.

THE LAST STAND.—By Freder

EDERIC REMINGTON.—[SEE PAGE 23.]

LORINDY'S DOUBLE HOLLYHOCKS.

BY BESSIE MORGAN.

"THOSE hollyhocks," said Miss Rebecca, "'long there by the fence I call after Lorindy—she that *was* Lorindy Stark, you know—'cause I got the seed from her. They're real handsome, I think, they're so double. Lorindy set a store by 'em always. She lived with the widow Wynn, in Seldensville. She'd had a sight o' trouble, the widow had, an' you'll believe me when I tell you she'd lost three husbands 'fore she was forty years old. She was clear discouraged with *tryin'* to be married. Lorindy was a cousin o' hers, an a cheerful-spirited girl; so she got her to come an' stay with her, to try an' chirk her up.

"It was a kind of a mournful place for Lorindy. Mis' Wynn kep' all three o' her husbands' photographs on the parlor mantel, with their silver coffin plates right in front on 'em. On Sunday nights she'd go in an' look at 'em, an' cry. She was real good-lookin', the widow was, one o' the sort o' women that men like, an' her husbands had all left her money. She could had her fourth jest 's well as not if she'd wanted him. That row o' silver plates on the mantel didn't seem to scare 'em any. But the widow always told 'em 'twas a vale o' tears, an' 'twa'n't no use for her to think o' happiness again in this world. Her last husband, Peter Wynn, left her a real handsome place, an' money enough to keep it in order an' have everything she wanted besides. Lorindy didn't see why she couldn't be happy. But Mis' Wynn always told her she didn't know what it was to have a husband, let alone three, an' lose 'em all. Lorindy didn't want to marry nobody. She was kinder sick o' hearin' 'bout husbands, anyhow, an' she did her best to make things pleasant for her cousin, but I reckon she'd had a lonesome time of it if it hadn't been for the flowers. Peter Wynn had been dreadful fond of 'em, an' he'd an oncommon nice garden.

"Mis' Wynn said she couldn't bear to look at a posy now, it made her think so of Peter, but Lorindy took solid comfort with 'em, specially the hollyhocks. They was double as roses, an' all colors. Once, when she was goin' to a party, she picked a lot o' the pink ones, an' trimmed her white dress with 'em, an' wore some in her hair. They looked real pretty, an' I guess a good many o' the young men thought the same. They all felt kinder put out when Martin L. Floyd went home with her, an' Lorindy was a little disappointed herself. He was a good deal older'n the rest, an' a plain-lookin' man, but he was good—Martin Luther his name was. He didn't often go to parties, but that one was at his cousin's, so I s'pose he felt kinder 'bliged to be there. He didn't dance, nor play games, nor nothin', but jest stood in the corner lookin' on, as if it 'mused him to watch the young folks, an' I reckon Lorindy in her pink hollyhocks sorter catched his eye. Lorindy couldn't see what he wanted to go home with her for. 'Most any o' the others would 'a' been better company for her, but she tried to be pleasant an' talk with him as they walked along. He wasn't much of a talker himself, an' she thought 'twas dull enough.

"She found the widow up, waitin' for her, an' though 'twas plain she'd been cryin' over them photographs again, she wanted to know all 'bout the party, an' Lorindy sat down, late as 'twas, an' told her. The widow was real interested, but when Lorindy come to mention that Martin L. Floyd see her home, Mis' Wynn she took out her pocket-handkerchief an' begun to cry.

"'I had hoped I should be permitted to keep you with me,' sez she.

"'What on earth's goin' to hinder?' sez Lorindy, openin' her eyes.

"'Martin L. Floyd is,' sez the widow. 'No, it ain't no use for you to shake your head. He's a serious man; an' whatever he does, he means serious.'

"'I don't care what he means,' sez Lorindy, beginning to get cross. 'I don't want to marry, anyway; but if I did, I know a dozen I'd rather have 'n him.'

"'Why, you'd be flyin' in the face o' Providence!' sez Mis' Wynn, cryin' more'n ever. 'He's a good man, an' he's well off; an' they're goin' to make him a deacon in the church, I've been told. Girls are so foolish! They'll let their opportunities all slip by, an' then feel bad 'cause they never got married.'

"'I wouldn't marry him if there wa'n't another man in the world,' sez Lorindy, gettin' more 'n' more worked up.

"'Oh dear! oh dear!' groaned Mis' Wynn; 'I never knew a girl to say that 'bout a man that she didn't take him in the end. Oh, I *had* hoped I was goin' to be able to keep you with me for a spell!'

"But Lorindy was so mad she just jumped up an' went off to bed without another word. Well, it 'peared as if the widow knew what she was talkin' 'bout, for when Sunday night come round, there was Martin, reg'lar as clock-work. He never arst to see no one in particular, but just inquired if the ladies was to home; so, course, Mis' Wynn had to go in an' see him, well's Lorindy. But she'd welcome him real cordial, an' then draw off to one side, an' leave Lorindy to do all the talkin'—an' she had it all to do. Martin, he only seemed to want to listen. Lorindy said, when she come to go to bed, her throat was tired 's the minister's; an' after it had been goin' on two or three weeks, she 'clared she wouldn't stand it no longer. She hadn't never said she'd keep company with nobody, an' she wasn't goin' to.

"'I'm goin' out this evenin' myself,' sez she. She was standin' front o' the parlor lookin'-glass, pinnin' on some more o' her pink hollyhocks.

"''Twouldn't look well for you to go out when you know he's comin',' sez Mis' Wynn, 'an' leave me here all alone; he'd think I s'posed he was comin' to see me. Besides, it ain't right for you to trifle with such a man, Lorindy.'

"'Good gracious!' sez Lorindy, 'who's triflin' with him? Who'd *want* to trifle with such a man—great, awkward, homely creature—'

"She stopped pretty sudden, for happenin' to turn round, she see Martin standin' there in the open front door. He'd rung, but they hadn't heard him. Lorindy, she just stood still. She didn't know what to do; but the widow knew. She bustled right forward, an' seemed pleased to see him as could be. She knew they hadn't mentioned no names, an' if only Lorindy could carry it off well 's she did, there wa'n't no need o' his thinkin' 'twas him 'twas meant. But Lorindy couldn't do nothing to help; she said 'Good-evenin'' when he came in, but she said it dreadful faint, an' didn't durst to look at him.

"Well, Martin he sat down. He'd heard what she said, course, but he wa'n't mad. He didn't have no vanity, so you couldn't hurt it. If she'd said he wa. a bad man, or mean, he wouldn't 'a' liked it, but he knew he wa'n't han'some, an' he didn't spect nobody to think he was. He reckoned his Maker 'd fixed him as He thought best; 'twa'n't nothin' he'd had any hand in noway, so he wa'n't responsible. He did more talkin' that evenin' than he'd ever done in one o' his visits afore; an' he kep' tryin' to draw Lorindy inter the conversation, an' lookin' at her kinder wistful, as if he wished he could tell her right out that he hadn't minded what she said. But Lorindy couldn't get over it; she left all the talkin' for him 'n' the widow. 'Peared to her she'd said 'most enough for one evenin'—'a great, awkward, homely creature!' 'Twa'n't no harm to say a man was 'large'; an' 'awkward' wa'n't anything very dreadful, but as for the rest on't, there didn't seem to be no way of excusin' it, however you twisted and turned it. Then she looked at him sideways. He wa'n't very plain, after all; he made her think of a big, honest, good-natured dog. She'd never said unkind things 'bout him, tiresome as he was, if the widow had let her alone, an' not talked 'bout his bein' a *serious* man, with *serious intentions;* no girl could help gettin' cross.

"Martin didn't stay late 's usual that evenin', an' when he rose to go, the widow, she said: 'Lorindy, don't you want to go an' cut a bokay for Mr. Floyd to take to his mother? I reckon it ain't too dark to find 'em.'

"Lorindy jumped up, thankful as could be for a chance to get off, an' then she see Martin was comin' with her. She didn't know what to do.

"'Won't you come too, Cousin Melia?' sez she.

"But the widow, she looked at Peter Wynn's photograph on the mantel, an' shook her head; then she turned away with her handkerchief to her eyes, an' Lorindy knew 'twas no use to ask her, so she snatched up her garden scissors an' went out. The widow took down her handkerchief to see 'em as they went by the window, an' then she went over an' stood lookin' at her husbands' pictures.

"'They were good-lookin' men every one of 'em,' sez she to herself. 'I don't blame Lorindy one mite.'

"Peter Wynn's garden was laid out real pretty; he'd took a sight o' trouble with it, an' he was a man o' taste, Peter was. I wish you could 'a' seen the arch o' purple an' white clematis that led to it, an' the wide path goin' down through the middle, with rows o' them splendid hollyhocks each side. There was other walks, branchin' off this way an' that; an' on the side towards the road he had a fountain; it hadn't never worked very well; still 'twas there, an' there wa'n't another garden in the town that had one.

"'Hollyhocks looks pretty, growin',' sez Lorindy, as they went down the walk. She knew she must say something, an' she couldn't think o' nothin' else.

"'They're the prettiest flowers in the world,' sez Martin, so sudden an' decided that he made her jump.

"'Do you like 'em in a bokay?' sez she, kinder scairt; an' she cut off a great spike of 'em, heavy enough to 'a' knocked a man down with.

"'Oh, that's a pity!' sez Martin, but he was too late to stop her; then she stood with it in her hand, lookin' at him. 'It's a bokay all by itself,' sez he. An' then he went on: 'Lorindy, I want to ask you a question. As I come up to the door to-night I heard you say—I wasn't listenin', but I couldn't help hearin'—I heard you say you didn't want to keep company with nobody, an' you wished—somebody 'd stop comin' to see you. Did you mean it?'

"Lorindy she held her branch o' hollyhocks up front o' her face, an' kinder smelled 'em, though, han'some as 'twas, 'twa'n't noways sweet. She didn't know nothin' what to say. She didn't want to be rude to him again, but she couldn't tell him to keep on comin' to see her, for she hadn't forgot what the widow'd said 'bout serious intentions.

"'You needn't be 'fraid o' tellin' me,' sez he, gentle, as if he was speakin' to a child that was scairt.

"Lorindy looked at him through the hollyhocks, an' she couldn't help feelin' sorry for him, for though he tried not to 'pear as if he was disappointed, he couldn't help showin' it some. But she knew 'twas best to tell him right out.

"'I—I did mean what I said 'bout keepin' company,' sez she; 'but I—wouldn't have been so rude if I'd not been cross. I—I'm very sorry for what you heard me say.'

"'Oh, you needn't mind,' sez Martin. 'I'd a great deal rather know. I might have kep' on comin' to see you for—nobody can tell how long. Just think how tired you'd got o' the sight o' me!' sez he, kinder raisin' his eyebrows an' smilin' at her. 'Can I have my bokay?' takin' the hollyhocks out o' her hand.

"They was all she picked for him to take to his mother. Lorindy let him have 'em. She stood there, makin' her mouth up like a baby that's goin' to cry. She didn't say nothin', an' Martin he looked down at her a minute without speakin'. Then he kinder sighed to himself, an' went off with his hollyhocks.

"The widow made Lorindy tell her everything they'd said in the garden, an' then, sez she: 'Comin' from him, that was the same thing as a proposal, an' you've refused him. Oh dear! oh dear! You'll never get another such chance. I know he ain't han'some an' attractin' in the way that takes a young girl's fancy; I don't blame you for wantin' looks; I always did myself; but they ain't everything, after all.'

"'His looks hadn't nothin' to do with it,' sez Lorindy, beginning to cry. 'I don't want anybody. An' you said you liked me to stay with you.'

"'Well, so I do,' sez Mis' Wynn. 'But I don't want you to miss everything on my 'count, an' I do like Martin Floyd real well. He's worked hard all his life doin' for other folks; an' if he's laid up money, he 'ain't never kep' it jest for his own enjoyment. Fur's I know, this 's the first time he's ever tried to have anything for himself.'

"Lorindy didn't say nothin', an' the widow see 'twa'n't no use, an' gin up argerin' with her, though she did say it seemed real lonesome come Sunday night. Lorindy wa'n't one to talk much, but I do believe she got to thinkin' 'bout Martin real friendly then for a while; but he didn't come round no more, an' that fall Lucius Niles took up visitin' her. Mis' Wynn she felt bad 'nough 'bout it. He was a good-lookin' young fellow, an' one that always made himself very agreeable to the ladies, but he wa'n't no hand to work, an' I guess he calculated to depend on his mother for what he had. They was a good family, the Nileses; Mis' Niles she had some money, an' Lucius was her only son. I reckon she'd spoiled him. The widow knew he'd make a poor sort o' husband for any girl, but same time she knew in such cases it wa'n't safe to say much. She did 'mind Lorindy that she'd said she wouldn't keep company with nobody, an' she couldn't help sayin' she thought Lucius Niles was pretty much like her hollyhocks—tall an' showy, an' precious little 'count any other way. 'But I like hollyhocks,' sez Lorindy; an' the widow didn't say no more. She'd been married times enough herself to know how 'twas.

"A girl 'll always say she wouldn't look at nobody till the right one comes along; then you can't stop her, no more'n you could the east wind. But the widow couldn't help takin' pride in the sort o' husbands *she'd* took. If she had been married three times she hadn't made a fool o' herself ary once.

"But I reckon Lorindy was kinder fascinated by Lucius. She wouldn't hear to nobody, an' he kep' comin' to see her all that winter, spite o' the widow's turnin' a cold shoulder on him, an' makin' him anything but welcome. She always staid in the room, the widow did, while he was there; sometimes she'd be lookin' over Peter's desk, in the corner, sighin' enough to make the cheerfulest folks feel low-spirited, an' sometimes she'd take one o' her husbands' photographs—it didn't matter which—in her hand, an' walk up an' down the room with it, her eyes sot in her head.

"I guess Lucius found her a sort of a hinderance, an' when spring come he'd ask Lorindy to walk in the garden with him, till he found the widow always come too, photographs an' all, an' she sighed an' groaned so much more out there, where everything reminded her o' Peter, that they was glad to get back inter the house again. Lorindy felt kinder put out with her sometimes, but long's she lived with her cousin Melia she couldn't say nothin', an' Lucius kep' comin' till one evenin' Mis' Wynn's patience was wore out, an' she up an' told him she'd made up her mind to leave all her money to build a home for poor widows in that town, an' arst him where he thought would be a good situation for it. Well, if you'll believe it, he didn't come up the next Sunday night. The minister had a niece stayin' with him from Brooklyn, an' he went an' called on her. Mis' Wynn was pleased as could be, but Lorindy felt bad, though she did her best to act as if she didn't care: a girl don't like to be dropped that way, an' she wouldn't believe what the widow told her was the reason he'd stopped comin'.

"'I could prove it to you easy enough,' sez Mis' Wynn, 'by goin' down an' mentionin' to his mother that I'd gi'n up the poor widows, an' was goin' to leave my money to you instead, an' I'd do it in a minute, only I don't want him back again.'

"The widow was real good-hearted. She knew she'd acted for the best, but she hated to see Lorindy lookin' down in the mouth, an' she kep' tryin' to think what she could do to make it up to her. She thought perhaps they didn't get out enough. The weather was gettin' warm, an' drivin' might be good for Lorindy. They tried it once or twice, but their horse was so slow Lorindy said she'd rather walk, then maybe she'd get somewhere after a while. The widow herself thought 'twould be kinder pleasant to have one that travelled a little faster, so when she heard 'bout Deacon Spraggins havin' one to sell, she went over to see him. 'Twas a pretty horse, an' the deacon said 'twas gentle, only 'twas too light for the work he had to do. The deacon was a reliable man, so the widow didn't hesitate to take his word for't, an' the bargain was made. Then she an' Lorindy went drivin' round the country, an' enjoyed it real well.

"Let me see, I guess 'twas near the middle o' July when that horse run away. 'Twas one afternoon, the widow an' Lorindy was out drivin', an' they went up past Martin Floyd's farm. They hadn't seen nothin' o' him 'ceptin' in church for 'most a year. His house looked real pleasant as they went by, standin' there under the maples, the big double front door wide open for the cool breeze to get in. Lorindy said she guessed they must be expectin' company. The words wa'n't hardly out o' her mouth when the horse shied; they never knew what scairt him, but he run. The widow couldn't hold him in. She did her best, but he went faster an' faster, right down that long rocky hill.

"Course they was both thrown out, an' Mis' Wynn was hurt considerable; but when they took up poor little Lorindy they thought she was dead, an' the visitors that wide pleasant front door was standin' open waitin' for went in, carryin' her in their arms. They took her up into the great front room, an' put her down on the high four-post bedstead that was always in readiness for whoever might come; an' there she had to lie for weeks. One o' her legs was broke, an' the doctor said he reckoned she'd got some internal injuries as well. Martin was one that helped carry her up to his house. He happened to be comin' up from the meadow with two o' his men at the time. He waited to do all he could an' hear what the doctor said; an' then he went down to the town to see Deacon Spraggins. Martin was as well 'quainted with that horse's character as the deacon was. If he'd known 'bout Mis' Wynn's buying it, he'd been to warn her; but not visitin' there no more, he hadn't heard 'bout it.

"Well, I guess he relieved his mind to the deacon, an' told him pretty plain what he thought o' a man 'twould sell such a creetur as that to a woman. 'Twa'n't the first time it had run away, by a good deal, an' the deacon knew it. But, land! he was a good man on some p'ints, an' 'twouldn't be safe to buy a horse o' the archangel Gabriel; the best o' folks 'll cheat when it comes to that business. But, as I was sayin', Martin spoke pretty plain to the deacon, an' it settled his chance o' ever bein' 'lected to hold office 'long with him. Deacon Spraggins had a deal o' 'thority in the church, an' he told 'em Martin L. Floyd wa'n't fit for no such position. But I reckon Martin wouldn't 'a' took it while Spraggins was in, so 'twas jest as well. Folks can't never seem to see the difference 'tween bringin' their religion inter their every-day life, an' bringin' their every-day life inter their religion.

"An' Lorindy lay up in the Floyds' spare room: an' the widow an' Mis' Floyd took care on her, with Mis' Pierce, one o' the neighbors, to help off an' on. Everybody felt bad 'bout her accident, an' come to inquire for her, an' offer to do what they could—everybody but Lucius Niles. He was heard to say 'twas a dreadful pity 'bout Lorindy Stark's havin' to be lame for the rest o' her life, for the widow wa'n't goin' to leave her no money. Somebody told Mis' Wynn what he said, an' she laughed right out, but she didn't say nothin'. Lorindy couldn't get reconciled to the idea o' bein' lame. The doctor found her cryin' over it one day, an' he told her she needn't be scairt, she was doin' well, an' her dancin' days wa'n't over yet by a good deal; an' after that she felt better. When she got so she could be moved, Martin used to come up every mornin' 'fore he went off to his work an' carry her over to her sofa, an' at night he'd move her back again to her bed. He was dreadful glad to have a chance to do somethin' for her; an' he was strong an' gentle. Lorindy told him he was the only one who ever touched her that didn't hurt her, an' he was pleased enough. So Lorindy lay there through the long summer days listenin' to the locusts singin' out in the trees an' the hay carts goin' creakin' by in the sleepy sunny afternoons; an' she did a deal o' thinkin'. She knew pretty well by this time that her cousin had been right 'bout Lucius. Not that I think she'd ever cared for him; she'd jest been fascinated, as girls will be sometimes; an' lucky it is for 'em when they find out their mistake 'fore it's too late.

"Well, by-'n'-by Lorindy got where she could walk about a little by herself, an' one night when Martin come up as usual she looked up at him kinder saucy, an' told him she didn't mean to bother him no more; she was goin' to be independent after that. But Martin he took her up in his arms jest as usual.

"'It ain't best to be in too much of a hurry 'bout independence,' sez he.

"'The first thing anybody knows I'll be so spoiled, I'll insist on bein' carried 'bout for the rest o' my life,' sez she.

"'By me?' sez Martin, very quietly; an' Lorindy turned red as fire; she hadn't meant to lead up to nothin' like that.

"'I guess you'd beg to be excused,' sez she.

"'I'm ready to take the contract,' sez Martin, layin' her down careful as could be. An' Lorindy 'membered how she called him awkward, an' all the other hateful things he'd heard her say 'bout him, an' her eyes got full o' tears, she was so 'shamed an' sorry; but she tried to laugh it off.

"'Nobody could do it without hurtin' me but you,' sez she, as she'd told him once before, an' Martin stooped down an' kissed her. The widow was standin' right there, but he didn't mind her a mite.

"'Oh,' sez Lorindy, hidin' her face in the pillow, 'I didn't mean that.'

"'The contract is signed and sealed,' sez Martin. 'There's no goin' back from it now.'

"'But perhaps I'll be lame for all my life long,' sez she, lookin' up at him dreadful piteous.

"'You won't never know it with somebody to carry you round,' sez he.

"Well, child, I guess that's 'bout all the story. Lorindy was married in a white dress trimmed over with pink hollyhocks, jest as she'd worn 'em to the party when Martin L. Floyd fell in love with her. Folks said Lucius Niles felt bad enough 'bout it, for he'd liked her real well; and the day o' the weddin' the widow give it out to everybody how she'd willed all her money to Lorindy."

THE WORLD'S VERDICT.

The drops of water slung across the camels' back
Had leaked, and all the day upon the desert sands
The water, drop by drop, had fallen, till at last
The skins were well-nigh drained, and that which still remained
When gathered in the cup of gold made fewer drops
Than there were jewels bordering the goblet's bowl.

The brother pilgrims, who together sought the shrine
Of holy Ali's martyred sons, at *Maggrib*, saw
The ruin which the day had brought unto their lives,
And each one looked the other steadfast in the eye.
Each saw the shadow of the wings of Azrael,
Yet for a moment neither spoke, save in low prayer,
And then the elder whispered, "Brother, drink, and peace and life be thine."
The other answered: "God is God.
It is the Prophet's will—drink thou."
Thus argued they
Until *El Marfa*, and they laid them down to rest,
The cup between, and each held out his hand to push
The goblet with its precious drops of life away.

It was *El Ghudda* when they waked. The burning sun
Had been on high four hours, and within that time
Had dried the water up. When this the brothers saw,
They bowed in prayer, and rising, loosed their beasts,
And bade them wander where they would. Then, sick and faint,
They laid them down again, and in their dreams of thirst
The cup o'erflowed with crystal water which each gave
Unto his brother.
When again the red sun set
They passed into the Garden of the Faithful Ones.

Next day a caravan passed by that spot, and saw
The brothers lying with their hands stretched out as though
To grasp the golden cup, each still in death's embrace.
And one long-bearded sheik, whose hair was white with age,
Picked up the cup, noted the studding gems, and sighed,
Questioning the greed by which man was made to give
Up life, and all life held, for one small bit of gold.

And then the caravan passed on again.

FLAVEL SCOTT MINES.

NEW ANTARCTIC EXPEDITION.

ARRANGEMENTS, it is understood, are again being made for an expedition to the region of the south pole. The expedition will be of a joint character, as part of the expenses will be borne by the Australian colonies and part by Great Britain; and Sweden and Norway will be interested in the enterprise, through the promised co-operation of Baron Nordenskjöld and Baron Oscar Dickson. The understanding is that unless some unlooked-for obstacles present themselves the expedition will set out some time during the course of next summer.

In a sense the scheme is not altogether a new one. It is rather the resumption of a scheme which was brought forward toward the close of 1887. At that time the Australian colonies, through Sir Graham Berry, represented to the home government that, in their opinion, great good might be effected by what they were pleased to call an "antarctic reconnoissance," and as a preliminary to an expedition for the thorough exploration of the antarctic regions. In order to give effect to the suggestion, and by way of encouraging the home government, the Australian colonies offered to contribute £5000 ($25,000), on condition that a like sum be given by the mother country. The proposal was well received. The Colonial Office, the Royal Society, and the Royal Geographical Society all lent encouragement to the enterprise. It seemed for a time as if nothing was to be allowed to stand in the way of the expedition. In January of the following year, however, the Treasury announced that it did not see its way to making the grant, the objects to be attained not appearing to be such as to justify the expenditure of even so small a sum.

It was natural that in certain circles the decision come to by the Treasury should have occasioned a certain amount of regret. It was for a time the cause of a little bad feeling in the colonies immediately concerned; and there were many persons, both in the colonies and in the mother country, who considered it unfortunate that such an opportunity for co-operation in an undertaking of so much importance should have been allowed to fall through. In scientific circles the regret on account of the rejection of the Australian proposal was the less, because the hint was thrown out that antarctic exploration might be taken up by the Imperial government in the near future, and on a scale of magnitude corresponding to the interests at stake and to the requirements of the situation.

This grander expedition has not yet taken shape. It is understood, however, that the British government is no longer unwilling to co-operate with the colonies in the matter. The revival of the scheme, in fact, is very much due to Nordenskjöld and his rich friend Oscar Dickson, who never fails to come to time with his money, and to whom the great Swedish explorer has been greatly indebted for his past successes in the regions of the North.

Nordenskjöld is beyond all question the most experienced polar authority now living; and everything else being satisfactory, the Australians must be considered as fortunate in obtaining the co-operation of such a man. It is not only that he is an accomplished scientific observer, skilled by long experience in ice navigation, and capable of making the most of the means at his disposal; his economic management, indeed, approaches perfection. With the full details of the arrangement we have not yet been made familiar; but we only state the fact when we say that the conviction which prevails among those best acquainted with the man, and with the work to be done, is that success cannot fail to attend any antarctic exploration enterprise with which his name may be connected.

The original Australian scheme contemplated, as has been stated, a mere reconnoitring cruise around the antarctic region. It was this limited purpose which led the British government, in the early part of 1888, to throw cold water on the enterprise. It is understood that the scope of the project has been greatly widened; and there can be no doubt that a larger purpose was necessary to justify any high expectations of satisfactory results. A mere reconnoitring cruise would be of little value. We know so little about the condition of things in the antarctic region that it is but slight exaggeration of fact to say we know nothing. We know but little as to what land there is, and even less as to how that land is distributed. We know that there is abundance of ice; but whether the ice barriers which have been encountered indicate corresponding stretches of coast, we cannot tell. We know little of the character of the temperature of the air or water, of the pressure of the atmosphere, of the snow or rain-fall; and of the fauna and flora, we know just enough to make us eager to know more. To make the necessary observations, and to give value to the results, much work and much time are needed. It would be necessary, for example, to leave a party as far south as was compatible with reasonable safety for a whole year. The party, in addition to the ordinary means of subsistence, would have to be provided with sledges, Norwegian snow-shoes, and other kindred requirements. All this means expense; and it is extremely difficult for the uninitiated, however it may be for the initiated, to see how it is to be accomplished at the small cost of £10,000. On this point Captain Pascoe laid great stress on the occasion of the recent meetings in Australia. In view of these hard facts, it is to be borne in mind that Nordenskjöld is to make out all the plans, and whether he shall or shall not accompany the expedition, he is to be its controlling head. He is not likely to begin if he does not see the end from the beginning. The presumption is that purse strings will be at command far beyond the limits of £10,000.

Rightly to appreciate the importance of the proposed expedition, it is necessary to have some knowledge of what has already been attempted and accomplished in the same direction. It was long a belief that a vast continent extended from the south pole up into the Pacific as far as the equator. Van Dieman and Tasman had repeatedly coasted Australia and New Zealand; but it was not until Cook had, in the last century, sailed round and round the Antarctic Sea, and had settled the forms of New Zealand, New Caledonia, and other Australian lands, that the idea of this vast Southern continent vanished. Cook penetrated to 71° 10′ south. In 1819 Bellinghausen, a Russian navigator, reached 70° south; and two years later he discovered and named Alexander's Land and Peter's Land, then the most southerly islands known. Simultaneously with these discoveries, Palmer, an American, discovered the island which bears his name. Weddell, in 1822–4, penetrated to 74° 15′ south, three degrees farther south than Cook; but, beyond noticing an open sea to the south, his discoveries were unimportant. Biscoe followed in 1831; and before 1833 he had discovered and named Eldarlay Land and Graham Land. Sabrina Land was discovered by the *Eliza Scott*, a schooner from New Zealand in 1839. The United States expedition, under Captain Wilkes, in January, 1840, came upon what, with good reason, was supposed to be a continuous coast-line; but an ice line of from 8 to 12 miles in length made closer investigation of continuous land impossible. In the same year D'Urville made a similar discovery. He came upon what he considered an extended coast-line; but success in the matter of observation was hindered by the same obstacle which stood in the way of Wilkes. It was he who discovered and named the islands Adelie and Clarie.

The most successful of all antarctic explorers, so far, has been Sir James Clarke Ross, who made three separate voyages between 1840 and 1843. Family instincts and special training had eminently fitted him for this kind of work. He discovered Victoria Land, with its magnificent mountains, its active volcano, and its great ice wall. He traced the coast from latitude 71° to latitude 78° 10′, the nearest approach to the south pole yet made. In his third voyage he verified the discoveries of D'Urville, but found the islands to be of inconsiderable magnitude. He gave the names of his two ships *Erebus* and *Terror* to the two lofty peaks in Victoria Land; and he gave to the lower elevations the names of Ross, Crozier, Sabine, and Murchison. Ross's mission was avowedly scientific; and in this, as well as in other particulars, the voyages were eminently successful. The *Challenger* was the latest vessel in these regions, but she barely crossed the antarctic circle. Nothing has ever happened to raise a question as to the value or accuracy of Ross's work; but a large extent of surface within the antarctic circle remains unexplored. It is proper here to state that so far no attempt has been made to explore these regions with the aid of steam. It remains to be seen what steam will accomplish.

What has been the result of all these expeditions? The extent and character of the land discoveries have been indicated as we have advanced. There is a vague, undefined belief, however, founded on conjecture rather than on fact, that beyond the lands named, and nearer to the pole, is a great land mass, whose outer edge runs for many degrees along the antarctic circle, shooting somewhat abruptly south into a great bight opposite New Zealand; while on the other, the land stretches much further south, probably to within 80°. As we have said, however, this conclusion is based on conjecture rather than on fact, as the observations have been taken at isolated points. With regard to the fauna and flora the discoveries, although limited in range, have been of some value. Deer of various kinds have been found, also the musk-ox, the fox, and various other animals. The vegetation is rough and coarse, but the specimens do not justify any general conclusion. The geology of the region is yet a hidden mystery. From the purely scientific stand-point, it would be of the utmost interest to ascertain the nature of the fossil plants, if there are any in the antarctic land. It is no longer doubtful that Greenland, even in the tertiary age, had a climate like that of southern Europe; but we are in darkness as to what has caused the oscillations of climate on the earth's surface. There are those who think that the primitive home of man, and indeed of all life, was in the arctic regions. If the geology of the antarctic could speak to us, it might help to solve one of the greatest of scientific systems. Facts are much wanted.

It is gratifying to learn that interest in antarctic exploration is, after a long interval, reviving. We are not permitted to doubt that this expedition will take shape, and that success if possible will be achieved. Another expedition, it is understood, will start from Germany, at the sole expense of Dr. Neumayer, Director of the German Naval Observatory. The doctor is as well known in this country as in Germany. He is an enthusiast on the subject of antarctic exploration, and he has the means of giving effect to his wishes.

COLD WAVES IN THE UNITED STATES.

BY WILLIAM A. EDDY.

THE cold wave in the United States is usually heralded by a high wind from the west, and by a harsh dry odor in the air. At sundown and with the waning of twilight the wind stings as it blows along a cloud of icy dust. The severity of the cold wave may be estimated locally as having relation to the severity of the wind from the west and north. Before the fall in temperature sets in there are a few hours of cool clearness with a gentle wind from the west, which soon augments in force. The chilling effect is more uncomfortably noticeable than when the coldest point is reached with the going down of the wind.

The cold wave usually follows snow or winter rain. In storms like the New York blizzard the icy particles are driven before a cutting wind at a temperature of about zero. The coldness may come on during two or three hours, and may be felt before the snow has ceased falling. When the cold is extreme the winter stars glitter in the far clearness. Sirius, whose brightness has been carefully measured, and found to be four times that of any other fixed star, sparkles like a brilliant diamond. Then the snow grows hard and dry, the passing sleighs, and especially the wagon wheels, creak with a metallic sound, and the rivers send forth booming reverberating reports which startle the skater as the ice hardens its grasp.

The advance of a cold wave is generally caused by a decided storm centre in the Southern States, which draws the air of the polar regions rapidly southward. In the accompanying chart No. 5, drawn by Lieutenant John P. Finley, of the United States Signal Service, the direction in which the four types of cold waves move across the United States is clearly shown. It will be seen that the four dark long lines representing cold wave paths terminate in arrow-heads, showing the direction of cold wave movement, which is generally southeasterly. The dark lines show the direction of movement of a stream of cold air that may be five hundred or a thousand miles in diameter. Captain C. A. M. Taber, in his work entitled *Winds, Ocean Currents, and Ice Periods*, advances the opinion that the warm air of the tropics loses its moisture by condensation as it rises to higher regions of the atmosphere. This dry, cool, heavier air then flows northward, where it sinks to the surface, and gives rise to areas of high pressure, causing cold waves that generally follow in the wake of great storms. The northward oblique flow of the cold upper currents doubtless has relation to the accumulation of extremely cold dry surface air in British America and in the Northwestern part of the United States. But cold air sometimes finds its way eastward in a great volume toward the Gulf Stream, as seen in chart No. 5, where the four principal types of cold wave movement may be compared. Observe that only one of the cold waves charted moves southward. (Chart No. 5, cold wave path No. 2.) When compared with the movement of storms across the United States, the cold waves, with the exception of No. 1, are found to move far to the southeast, while the average storm movement, not here charted, is decidedly northeast. The most remarkable type of cold wave is the one that starts from the North Pacific coast (see chart No. 5, cold wave path No. 4), and with a tremendous sweep extends to the Atlantic coast, with an eastward movement through Colorado, Kansas, Missouri, southern Illinois and Indiana, Kentucky, and Virginia. It is evident, from the vast territory traversed by this cold wave, that it involves the presence of an immense mass of cold air to be found only in midwinter. There is a fifth kind of cold wave not here charted because of its exceptional local nature, which descends suddenly upon the North Atlantic coast from the north, or even from the northeast. It comes and goes in less than twenty-four hours, but it may, while it lasts, run the temperature down to zero as far south as Atlantic City, New Jersey.

In chart No. 1, of the cold wave of March 5, 1887, the inmost curved line drawn through points of the barometric high pressure traverses an area in which the barometer read as high as 30.97 inches, which is the highest reading recorded during the cold waves here treated, and one of the highest ever recorded by the Signal Service. The chart gives only tenths of an inch of barometric pressure. The winds, as shown by the small arrows, are all blowing away from the centre of high pressure, drawing an increasingly greater quantity of cold, dry, heavier air from regions high above the earth. Near the centre of this area the thermometer at Rockcliffe, Canada, marked 33° below zero, while about two hundred miles west the reading was 9° below, and about the same distance east it was 12° below. The temperatures steadily rise on all sides as the distance from the centre of high pressure increases until there are readings of 24° above zero at Chicago, and 71° above at Key West, Florida. The barometer shows that the clear bright air that accompanied the temperature of 33° below zero affected the country as far south as Key West, where the influence was, however, very slight. It is the rush of air away from the region where the barometer may read 30.97 inches, and the thermometer 33° below zero, that may cause the stinging blasts of cold from the north or west.

A peculiar kind of cold wave known to the inhabitants of the southwestern part of the United States, especially in Texas, is shown in chart No. 2. It is locally called a "norther." Such visitations are greatly dreaded in Louisiana and Texas, because of the great change from mild weather to a temperature nearly at zero. In western Texas, in the present instance, the readings were from 4° to 6° above zero. On the approach of this cold wave the temperature fell 40° during twenty-four hours, with furious winds blowing in opposite directions, sometimes from the south and then again from the north. Snow extended to the southern part of Texas, which is very unusual. This cold wave is one of the most remarkable ever charted by the Signal Service. Lieutenant Finley points out the fact that on the day before this chart was drawn the barometer at Fort Barry, Manitoba, registered 30.91 inches—one of the highest readings ever recorded in this country. The temperature at the same time and place was 40° below zero. The cause of this great blast of cold air, as traced out by Lieutenant Finley, was the sudden appearance in Montana and Dakota during the previous week of a storm centre of marked intensity. The cold air was drawn after this storm in great quanti-

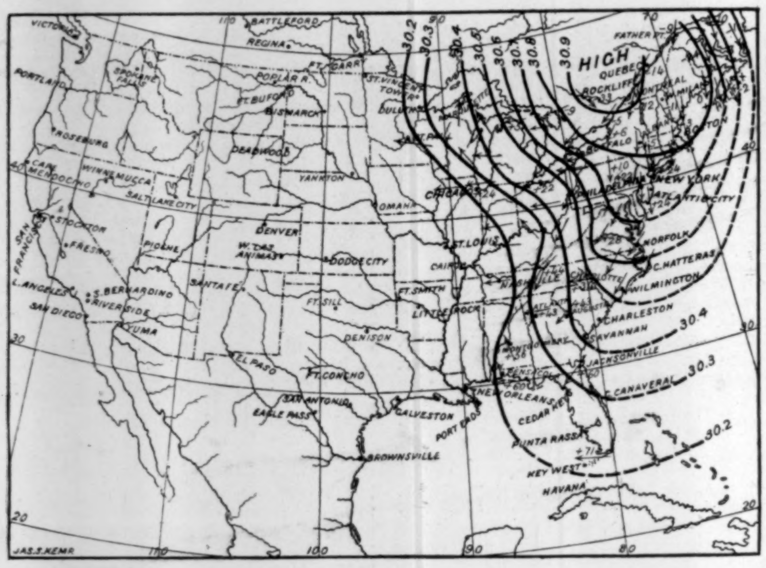


CHART No. 1.

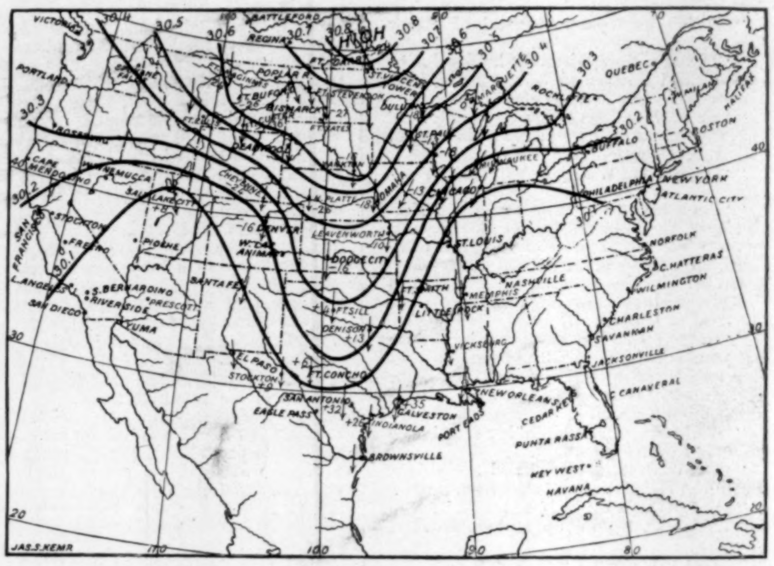


CHART No. 2.

ties as it moved southeast. The rush of air southward was further accelerated by the formation of still another storm centre, off the coast of Texas.

Chart No. 3 discloses the conditions that accompanied the coldest weather ever officially recorded in the United States, when the thermometer marked 63° below zero at Poplar River, Montana. It will be seen that within a few hundred miles of Poplar River at the same time the thermometer marked in two instances 30° below zero, while still farther away, principally northward, it marked 42° and 38° below. At Fort Buford, North Dakota, and at St. Vincent, Minnesota, the readings were 46° below zero, while at Tower, Minnesota, about four hundred miles eastward, a temperature of 48° below was recorded. The report of 63° below zero seems an error until we examine chart No. 1 herewith, in which the remarkable eastern cold wave there shown reveals a like discrepancy between the 35° below zero at Rockliffe, and the 11°, 9°, and 14° below of the surrounding country. During a cold wave which causes a fall of temperature from 40° to 50°, the special region of most intense cold is usually very small, and generally appears a little to the left of the region of highest barometric pressure, as shown by the chart. Farther north the air is warmer. At Poplar River the territory under the influence of the severest cold was probably not greater than about one hundred miles in diameter, because at Fort Buford, about the same distance westward, the temperature was only 46° below zero. The absence of moisture in the air was doubtless one of the special local conditions at Poplar River. But at other stations the cold was severe beyond precedent. At Duluth, Minnesota, the temperature was 41° below zero, and at West Las Animas, Colorado, 30° below—the lowest temperatures ever recorded at these stations. At St. Paul the reading was 35° below zero—the lowest but one ever recorded there. Temperatures in the Lake region, the Ohio Valley, and thence to the Atlantic coast fell from 30° to 40° in twenty-four hours. In various places in Montana and the Yellowstone region snow fell to a depth of more than two feet. Many people were lost in the deep snow, and frozen to death because of the low temperatures. Cold air was drawn down from British America in vast quantities toward a storm centre that suddenly developed great power, extending from the Mississippi Valley to the upper Lake region.

General Greely has called attention to the treeless nature of the high ground along the boundary line between British America and the United States, including Montana and Manitoba. The most marked average of extreme cold applies to this region instead of to that farther north. It appears that these plains of high elevation give rise to very low temperatures. Blanford has shown, as General Greely points out, that forests and vegetation retain moisture, which always lessens the radiation of heat. As the polar wave moves southward toward the northwest boundary of the United States, it is no longer affected by the heat-retaining moisture of the forests farther north in British America. The treeless plains and sparse vegetation of Manitoba and Montana cause the cold wave to increase in intensity as it moves southward.

Chart No. 4 shows the great California cold wave of January 13, 1882, which gave rise to severe cold weather in central and southern California. Deep snow was followed by freezing temperatures that caused ice to form almost to the sea-coast on the Mexican border. In fact, light snow fell at San Diego, in the extreme southern part of California. At Stockton, California, which is east from San Francisco, and near the centre of the State, ice formed an inch thick; and at Fresno, which is much farther south, the temperature fell to 21° above zero. Sheep froze to death in large numbers in southern California and Arizona. At Los Angeles the hills were covered with snow. At Riverside the snow was five inches deep, and a depth of from four to fifteen inches was reported from San Bernardino to the edge of the Mohave Desert. At points in southern California the snow was reported twenty inches deep. This appearance of winter weather in "our Italy," in a semi-tropical region, caused great astonishment. Such a cold wave in southern California may not be again experienced during half a century. As in previous instances, this mass of cold air was drawn southward by a storm centre, which had developed in southern California and Arizona.

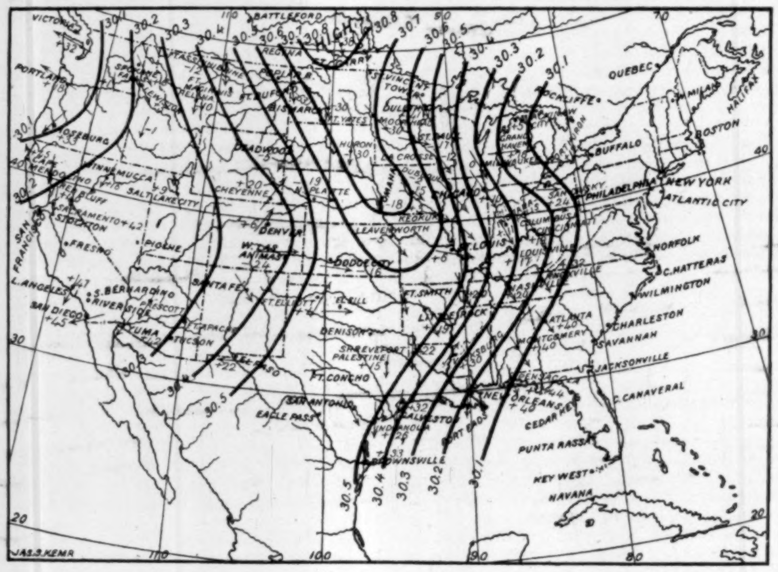


CHART No. 3.

It is, of course, desirable that such visitations be predicted, because a fall of temperature amounting to 71° in eighteen hours, which actually took place at West Milan, New Hampshire, March 5, 1887, may cause serious loss of life, especially when accompanied by deep snow. Owing to the general absence of meteorological stations in British America, the process of the development of these cold waves is still partly unknown, but the coming of a cold wave to the country farther south can be foreseen with a higher degree of efficiency than in the case of a storm centre. A storm may be very uncertain in its movement; it may suddenly cease; but a severe cold wave generally manifests sufficient persistence to result in verified forecasts. The cold wave forecasts of the Signal Service show a high average of verification as compared with those of wind and rain. Still farther north than Manitoba, where the ice is perpetual the greater part of the year, the cold wave is at home, with a temperature, as given by General Greely at Fort Congor, of 70° below zero. Some of the readings below zero, observed during various polar expeditions, as cited by General Greely, are as follows: Mercy Bay, 64°; Van Rensselaer Harbor, 66°; Floeberg Beach, 73°; from which it appears that the temperature of minus 63° at Poplar River during the great cold wave of January 1, 1885, was of truly polar severity.

Flammarion, the French astronomer and meteorologist, gives some of the lowest temperatures observed on the Continent, revealing the fact that the cold waves from British America travel farther south and with greater severity than those in Europe. In France a record of 24° below zero is given; in England, 5° below; in Holland and Belgium, 12° below; in Denmark, Sweden, and Norway, 67° below; in Russia, 46° below; in Germany, 32° below; in Italy, zero. But General Greely cites the lowest temperature ever recorded in the world as 90° below zero, at Werchojansk, Siberia. Other temperatures observed at the same place were 84°, 78°, and 77° below zero. This station is situated about 330 feet above sea-level, and in a valley where the sun is absent during December. As in the case of southern Manitoba and northern Montana, Werchojansk may be remarkable for the aridity or rocky nature of the surface upon which it is situated.

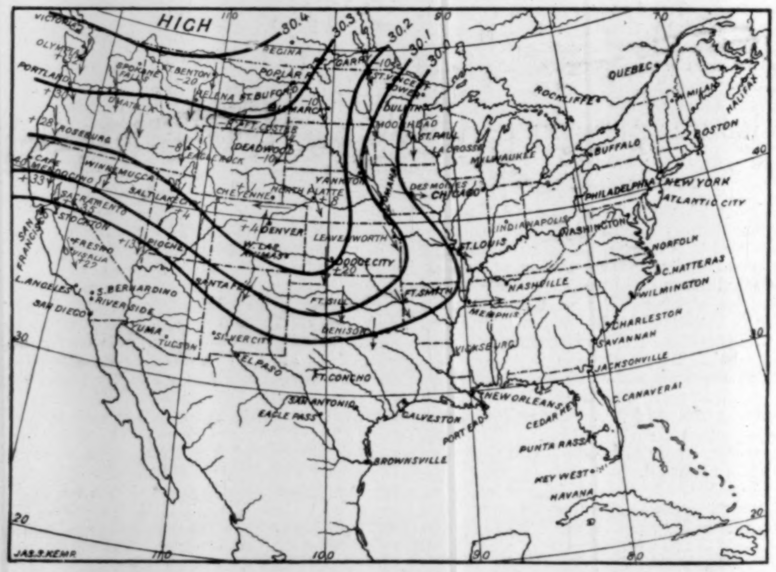


CHART No. 4.

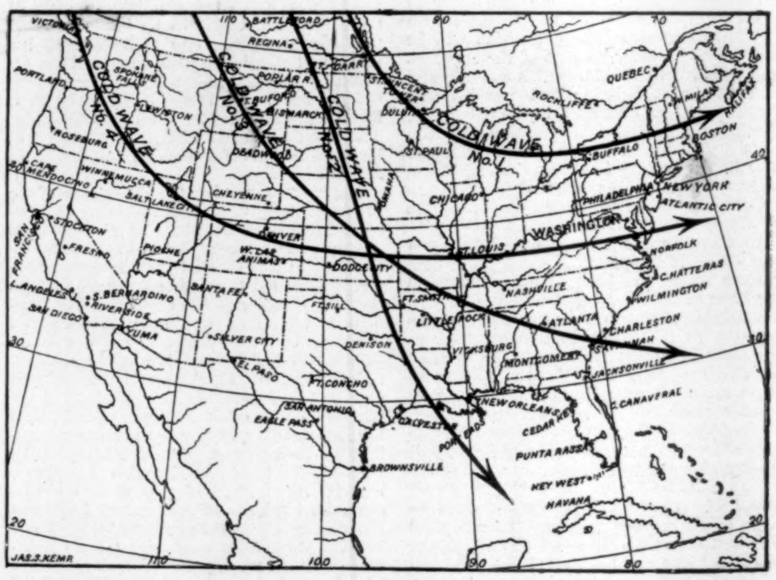
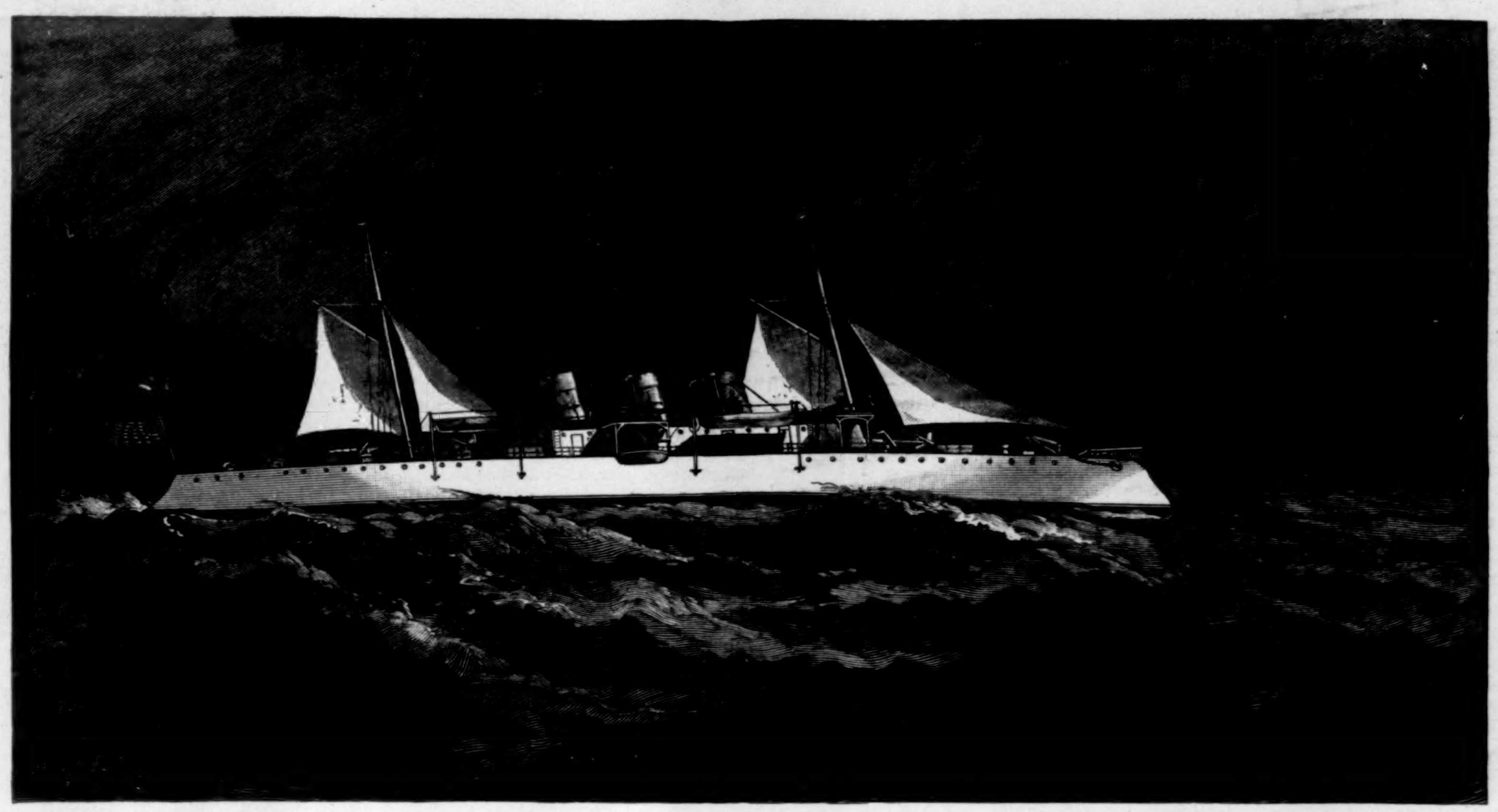


CHART No. 5.

CHARTS OF THE FOUR TYPES OF COLD WAVE PATHS IN THE UNITED STATES.

Charted by Lieutenant John P. Finley, Signal Corps, United States Army.



THE UNITED STATES TORPEDO CRUISER No. 1.—Drawn by J. O. Davidson.—[See Page 23.]

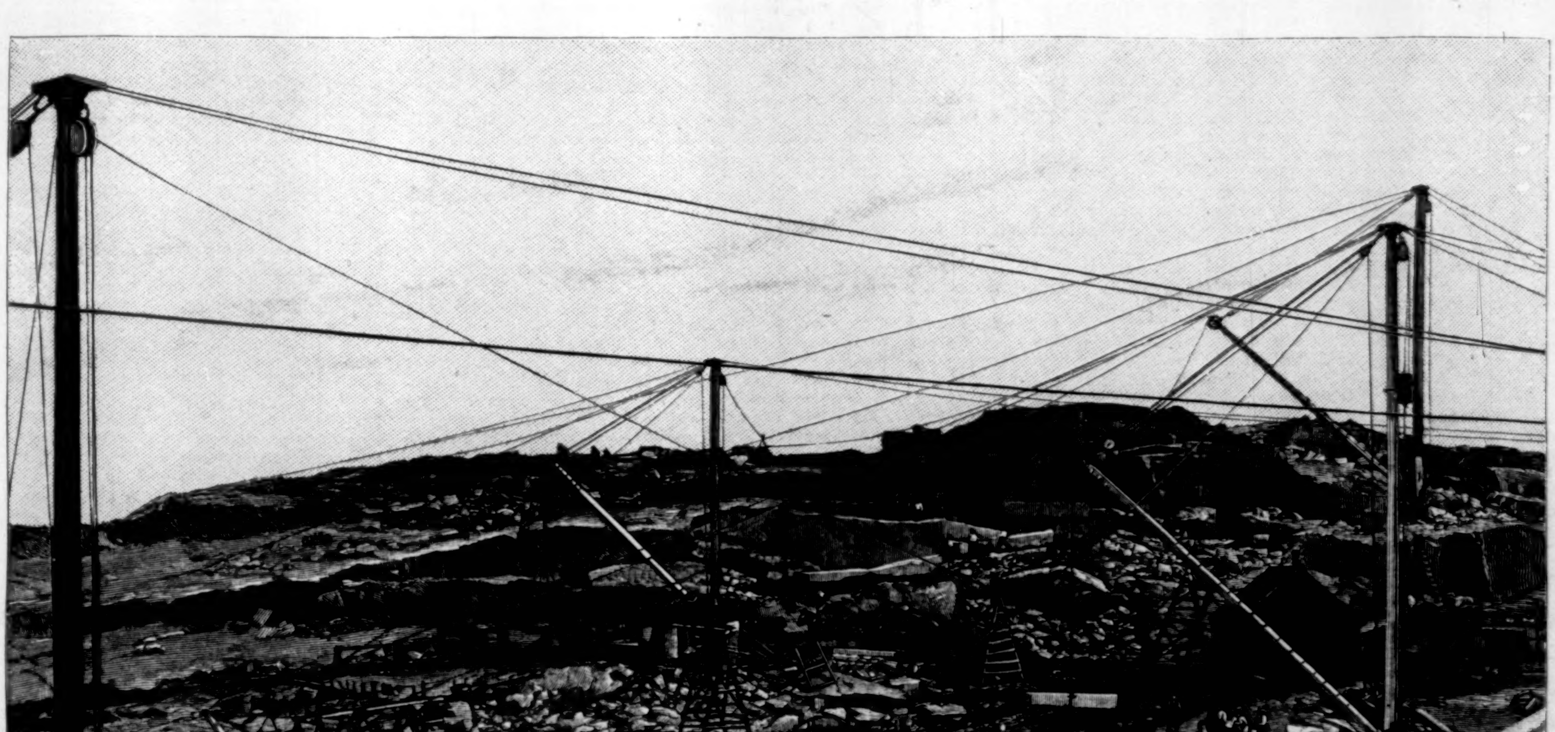
THE GRANITE QUARRIES OF THE NEW ENGLAND COAST.

What granite was to ancient Egypt so it is to the United States. It has been of vast use in the construction of our monuments, and especially of our public buildings. Whether we have yet produced any structure destined or able to last as long as those of Egypt may be reasonably doubted, for, aside from our methods of construction, our climate seems uncongenial to such durability as we see exhibited in the dry atmosphere on the banks of the Nile, where 3000 years appear to produce not the slightest effect on the sharp edges cut by the chisel. The recent style of construction now followed in our cities for large buildings, making the frame of iron enclosed by a thin casing of stone, especially granite, would seem likely to decrease the demand for that durable material, while the many inventions intended as a substitute for paving-stones also threaten eventually to decrease the value of the quarries of New England.

But as yet there is no more evidence that the demand for granite is falling off than that the supply is decreasing. In fact, the supply and demand continue inexhaustible, and the granite industry is one of the most vigorous and healthy in New England. The crop of stone was garnered there by a beneficent Providence untold ages ago, for granite is by many geologists supposed to be the oldest of mineral formations; and all that is now required is to go ahead and gather it for the building up and beautifying of great cities all over this land.

Quarries of granite may be and are exploited in many parts of New England. New Hampshire goes by the grim sobriquet of the Old Granite State. One may find much to interest and instruct by wandering through the granite regions from Connecticut to Maine. But there is one group of quarries which, yielding in importance to no other quarries in the world, possesses picturesque features that render it especially fascinating. We refer to the quarries following the coast-line from Eastport to Boston Bay, whose converging points are Penobscot Bay, Cape Ann, and the Quincy region.

Never was there a place more appropriately named than Rockland, Maine, near the western entrance of Penobscot Bay, guarded by the bold, aggressive head-land called Owl's Head. On every hand are quarries. The place itself, a flourishing city of 10,000 people, is almost a quarry, for the water-front is faced by lime-kilns and a trestle-work for the trains bringing limestone from the vast quarries a mile out from the city, while the wharves are thronged with coasters freighted with wood for burning the lime. The lime quarries are exceedingly interesting, presenting vast excavations 100 feet deep, great picturesque chasms, which the



AN EAST SHORE GRANITE QUARRY.—From a Photograph.

famous New-Zealander of the future may perhaps consider as freaks of nature. The Cobb Lime Company is the chief agency for exporting the Rockland lime, of which the annual shipments average 1,250,000 barrels, or 125,000 tons.

Thomaston and South Thomaston, Spruce Head and St. George, immediately adjoining Rockland on the south and Waldoborough on the west, contain an abundant supply of granite, which is being excavated at several quarries, that of Waldoborough being valuable for paving-stones; but it is on the islands of Penobscot Bay that one finds the most interesting quarries of that region, and perhaps of the United States. The quarries of Dix, Hurricane, and Fox islands are the most important. They are right out at sea, beaten by the gales of winter, and bathed by the almost Italian sunlight of summer.

The Dix Island quarry furnished the stone of which the New York city Post-office was built, and hence possesses a certain historic interest. But it is not worked at present, as its granite is found in irregular masses having no certain cleavage, and hence involving great waste of effort and material, while even at its best it is liable to be disfigured by dark blotches that impair its beauty when used for architectural purposes.

Hurricane Island has a wild name that suggests tempests and pirates. In reality it appears to be a focus for the squalls of Penobscot Bay, and many a passing schooner has bent low to the furious blasts sweeping down from its precipitous crags. It is a mere rock, and yet holds untold wealth within its narrow limits, for it presents a solid mass of most valuable granite, fit both for building and for monumental purposes. One quarry represents at least 100 acres of clear granite, reaching more than 150 feet above the sea, and as far below, were it necessary to quarry so deep.

For quarrying purposes the granite of Hurricane Island is of mixed value. Some of it is in bowlder form, and not altogether to be depended upon for cutting into regular blocks of any size, while some, and that the larger proportion, is in layers that can be cut with the ordinary methods to almost any desired size and shape. The largest monoliths of Egypt, or of the Druidic menhirs of Brittany —and some of them have been from 80 to 90 feet long—have been far surpassed by blocks cut at Hurricane Island. As a matter of curiosity, one block was cut out of its quarries no less than 200 feet long and 19 feet square. As there was no demand for such a monolith at that time, it was cut up into small sections. We beg to submit, however, that if the committee of the Grant Monument could secure such a monolith of New England granite, and transport and set it up in Riverside Park, they could fairly rival the feats of the ancients, and present the most remarkable monument of the ages. It is worthy of note that there is a derrick at these quarries, invented by the proprietor, which is able to hoist a block weighing 25 tons and move it in any direction.

Hurricane Island is owned by Mr. David Tillson, who until recently has worked the quarries himself. But they are now leased to the Booth Brothers, of New York, who also own granite quarries at South Thomaston. Of course all the stone quarried there must be shipped to market by coasters. The St. Louis Post-office was built by Mr. Tillson, besides numerous other important structures.

Almost within hailing distance from Hurricane Island is South Fox Island, whose landing-place and anchorage are at the southern end, and are known as Vinal Haven and Carver's Harbor. Fox Island is a long and somewhat lofty islet, more or less covered with scrub forests, and presenting many picturesque bits attractive to the artistic eye. But it must be admitted that the importance of this island is due rather to its granite than to its æsthetic aspects. It is a little singular that the formation of the island seems to suggest two distinct geologic epochs, divided as it is by a line running across it east and west. On the south of that line the granite is found almost to the exclusion of any other stone, while on the north of it there is not the least sign whatever of the existence of granite.

There is quite a little town at Vinal Haven, including several hotels, one or two of which are for summer visitors. But the business of the place is granite. There are several quarries, and two harbors, with docks and derricks for shipping the stone. One also sees there an artificial lake with floodgates, and supplied by the tides, which are considerably higher on that coast than south of Cape Cod. The water of this lake was used for power in running the machinery, and although largely superseded now by steam-power, it is still of use sometimes.

The quarries and plant of Vinal Haven are owned by the Bodwell Granite Company, whose president is Mr. George M. Brainerd. If not the largest and most important granite company in the United States, it undoubtedly has no superior, either in extent, the quality of its stone, the character of its plant, or the amount of the finished work shipped from its docks. The company is capitalized at $500,000, and besides its works at Vinal Haven owns valuable quarries of granite at Spruce Head and St. George, south of Rockland, and a very important quarry of red or sienite granite of a beautiful grain and that at Jonesborough, near Machias, which is taken to Vinal Haven to be cut and polished.

The quarries of Vinal Haven have furnished the stone for the State, War, and Navy Departments Building at Washington; the Harlem River Bridge; the Pilgrims' Monument at Plymouth, Massachusetts; the Carnegie Free Library, Allegheny City; the Pennsylvania Passenger Station, Philadelphia; the new Methodist Book Concern Building, New York; the Havemeyer residence; the polished granite for the State-house at Indianapolis; the new Federal Building, Brooklyn; and many other prominent buildings. Among the numerous monuments finished at Vinal Haven may be mentioned the Laden mausoleum, Woodlawn Cemetery, and the noble monument to General Wool at Troy, New York, composed of a single shaft of granite sixty-five feet long.

The company owns a fleet of schooners, in which it ships its granite, while another fleet is constantly employed bringing coal to Carver's Harbor for the use of the steam-engines and of the people residing there, or lumber for boxing the finished granite, a demand which alone consumes a very large quantity of wood. Hard as granite may appear, yet when cut and polished it requires to be protected from abrasion about as carefully as wood.

Great experience and dexterity are required in packing the granite on board the ships, and the hazard of navigating them with such a cargo across the stormy waters from Maine to New York is by no means trifling. To transport the Wool Monument it was necessary to cut a large hole in the bow of the vessel, and lay it carefully on a bed of cross timbers in line with the keel. The Bodwell Company ships some 40,000 tons of granite annually, both finished and unfinished. This really represents an enormous output, for a very large proportion of its shipment is cut, polished, and boxed, ready to be set up immediately on reaching its destination.

The company is exploiting two large quarries at Vinal Haven, and has a most extensive plant. The granite thus far quarried has been in layers or sheets, rendering it highly tractable. The formation of granite is such—being, as its name indicates, the aggregation of separate and independent granules—that one would suppose it to be always an amorphous mass liable to break off capriciously in any direction. Such it often is, as at Dix Island. But quite as often it seems to have solidified in layers or strata, and by taking advantage of these a straight cleavage can be obtained, the blocks varying in thickness according to the width of the stratum. Such is the case at Vinal Haven. The result is to minimize the necessity for using powder or dynamite, and to reduce the waste of material.

One of the most common methods of splitting off the rock from its bed, which is still used at Vinal Haven, although less valued elsewhere, is with a drill that makes what is called the Lewis hole. The drill has a triangular face perhaps an inch and a quarter wide. When one hole has been drilled, another is made about an inch and a half from it. The core between the two holes is then cut out, producing a diamond-shaped hole, which is filled with powder tamped in with sand. The points of the lozenge follow the intended line of cleavage, and for this reason they can be very far apart, even twenty to forty feet. Care is taken that at each end of the proposed block the stone has been completely separated. Thus, when the blasts are sprung simultaneously, a straight separation is made from end to end, and a complete mass is secured. Of course such a satisfactory result can only be depended on when the granite formation is regular, as at Fox Island.

Horses are now used instead of oxen to draw the granite from the quarries to the works. The drays are very powerful and furnished with derricks. They move on wheels of immense diameter provided with double felloes. The largest truck at Vinal Haven is called Jumbo; the wheels have a diameter of twelve feet.

There is a Corliss steam-engine of seventy-five horse-power, by which most of the heavy work at Vinal Haven is done, such as planing, modelling shafts, and the like. The turning lathe is similar to the one used at marble quarries, and eats into the granite with a tooth of steel that laughs to scorn the mighty tusks of antediluvian monsters. Held by clamps strong as fate the uncouth block of granite reluctantly comes forth from the tremendous ordeal a shapely, handsome shaft, ready for the emery polish that shall make it shine like a mirror, and bring out all the concealed beauty of vein and tint which was hidden while it remained in the rough. Granite, like human nature, needs discipline to develop the worth of which it is capable.

The process by which granite is cut down or smoothened differs somewhat from the rubbing bed used in shaping marble. In the latter case the bed of metal, covered with sand or steel dust, whirls under the marble. But in planing granite the process is reversed. The block of granite is firmly fixed with the face to be smoothened upward. A horizontal revolving iron disk then passes over it, cutting it down with sand or chilled iron dust and water. By two long levers the disk may be turned by the workman in any direction. The disk is really a wheel composed of a series of rings joined together. It is formed thus in order that the material that is thrown off may pass away instead of clogging the planing machine.

Perhaps the most remarkable feature of the great works at Vinal Haven is the cutting shop, where blocks are shaped and finished by hand in every form required for architectural and monumental objects. This is the largest establishment of the sort in the United States, and hundreds of carvers may be seen there busily plying mallet and chisel. The number of men employed at the Fox Island quarries, of course, varies from year to year according to the demands of the business, but it now averages about six hundred. Formerly, before the employment of labor-saving machines, the number was sometimes as high as twelve hundred. A large proportion of these men are Americans, while at most of our other quarries foreigners are largely employed—Irish, French, Italians, and latterly many Finns and Swedes.

There is a novel contrivance used at the cutting shop at Vinal Haven for facilitating the handling of the granite. An elevated railway begins outside of it, and runs the entire length of the interior of the shop. A frame on wheels runs on the rails, from which are suspended chains and clamps, reaching to a short distance from the ground. The truck, carrying a block of granite, is brought under the railway, and the stone is attached to the clamps and chains, and being lifted off the truck, hangs from the rolling frame on the railway, which can be easily moved by one or two men, and thus the block of granite can be pushed to any part of the shop and deposited there.

Thomaston, South Thomaston, St. George, and Spruce Point, at the southwest entrance of Penobscot Bay, also have granite quarries, turning out an abundance of the gray stone of that region, but calling for no special mention beyond the fact that they form part of the great system of the coast quarries of Maine.

The next distinct system of granite quarries on the New England coast is found at Cape Ann, which may be said to be literally a solid block of granite capable of supplying the world with paving-stones for a thousand years. Cape Ann is a small peninsula projecting from the coast of Massachusetts. Most people suppose that it reaches to the extreme eastern end; but the outer part of the promontory is in reality an island two or three miles square, separated by a narrow strait from the main-land, and small vessels can entirely circumnavigate it. This has been a fortunate circumstance for our fishermen caught in heavy weather off one of the most inhospitable parts of our coast; for if north of the cape on a lee shore, they could sometimes run for shelter into Squam, which is at the northern entrance of the Cape Ann Inlet. This gave rise to the old story of the Marblehead parson who was preaching a vivid sermon on the terrors of the last day, illustrating it to suit the life of the rough fisher folk whom he was addressing.

"In that day," said he, "when the sky is black with scud, and the wind is howling, and the sea is rising enough to founder your ship, what then will you do for a refuge, my friends?"

"Put up your helm, and make for Squam!" spoke up a weather-beaten skipper in the audience.

Advantage has been taken of several small rocky points to construct a number of miniature harbors around the cape capable of sheltering half a dozen schooners each. These quaint little ports form a peculiar feature of Cape Ann scenery. They are protected by high walls of granite built with much labor and expense, and are reached by narrow entrances wide enough for the passage of a schooner, and easily missed in the dark. The harbor of Rockport consists of several slips of this sort. Pigeon Cove is perhaps the most picturesque, with its little beach left dry at low tide, while the ports of Lanesville and Bay View are the most elaborately constructed. As one rides over the winding hilly roads of Cape Ann he experiences a sense of humor as here and there he perceives a line of masts rising among the rocks where he would least expect to find a safe anchorage.

But for these made harbors it would be exceedingly difficult to export the granite of Cape Ann by sea, for loading stone on a ship is a ticklish business, and can only be done in a secure haven. When the government finishes the great breakwater which it is now building parallel with the coast of Cape Ann, it will not only afford a harbor of refuge for ships in heavy easterly weather, but also facilitate the shipment of granite. The breakwater is to be 9000 feet long, and to contain 1,000,000 tons of stone up to within 22 feet of the surface. Already 350,000 tons of granite have been deposited, covering a distance of about 3000 feet. The last 22 feet of depth, and the part above the water, may be either of hewn granite or of concrete. The latter is generally considered the cheapest and most enduring material yet discovered for such a purpose when mixed with the ashes of sugar-cane, as it hardens by exposure to the elements. The cost of this immense work is estimated at $5,000,000, but the experience of the people, gathered from similar public enterprises, makes it doubtful whether this breakwater will be completed for any such trifling sum as that. The possibilities for a permanent income achieved in the New York Capitol at Albany may well stimulate other contractors engaged in public enterprises requiring years to complete. Shall the breakwater of Cape Ann prove a similar instance? Let us hope not.

The quarries of the cape form a continuous line from Rockport to Bay View. At least a dozen different companies are engaged in getting out granite on the cape, the stone being almost entirely the coarse gray quality suited for foundation pieces or for paving.

One of the most important of these companies, and the first to which one comes on leaving the station, is the Rockport Granite Company. The office is in the back part of a little country grocery store. All these cape companies have agencies or main offices in Boston, chiefly in the building of the Association of United Builders, in Devonshire Street. But on the cape the offices are generally in the rear of the way-side groceries, and when one of these is seen, one is pretty sure to strike the office of a granite quarry.

Passing through files of flour-barrels and under beams hung with sea boots, slates, fishing-lines, hatchets, hams, brooms, cheap hand-mirrors, oil jackets, school-books, marline-spikes, sounding-leads, and pickaxes, and through an atmosphere perfumed with plug tobacco, kerosene oil, molasses, and codfish, one reaches the small office where the secretary of the quarry holds lofty sway. According to the mood of the hour or the demands of business, he is found perched on a high stool at a desk wielding a quill over bulky ledgers, or seated on a box whittling, or in a rickety office chair tilted back so that he may rest his heels on the sill of the window, through which the ocean is seen, and the schooners in the little harbor below loading with stone. Around him are gathered the magnates of the neighborhood discussing the gossip of the cape, or mariners, encased in oil jackets and picturesque sou'westers, taking their orders and talking over the prospect of getting a slant across the bay with a load of granite before the quartering of the moon.

The granite of Cape Ann is taken to Boston in old sloops, and to New York and Philadelphia in schooners of some size. In any case a hazardous cargo, it is especially so for the sloops, which go loaded down to the decks. They are absolutely dependent on a fair wind and a smooth sea, and are often obliged to run for Salem when the weather looks threatening. Sometimes one of them springs aleak, and goes down so suddenly that the crew has barely time to scramble into the boat which is carefully towed astern.

The Rockport Granite Company is said to be capitalized at $200,000. I doubt the amount, and only give it as I heard it, being unable to obtain precise facts at the office, where, for the first and only time, a singular reserve was, for unknown reasons, apparent in giving information.

The Rockport Granite Company has a small harbor of its own, owns a number of vessels, and runs two large quarries at present, one of them of unusual magnitude. But it has no machinery beyond steam-drills and an engine for hoisting the granite. It ships the stone in undressed condition, chiefly for paving, excepting that some of the stone is squared or bevelled for foundations. I saw some large blocks in the sheds by the wharves that were being cut for the Mount Hecla Copper Mines, on Lake Superior, to serve as beds for the support of machinery.

The Pigeon Hill quarries are near Pigeon Cove. The company is capitalized at $50,000, and owns a made harbor, from which it ships annually about 40,000 tons of granite, chiefly paving-stones, to New York and Philadelphia. It also ships some cut stone, for monumental purposes, to be polished elsewhere. It employs about 130 men.

The Lanesville Granite Company is capitalized at $50,000, and pays for the use of the excellent made harbor which adjoins its quarries. This company gives employment to about 140 men, including sailors, and ships an annual average of some 35,000 tons of undressed stone to Boston, New York, and Philadelphia. The granite is quarried at all seasons of the year, although less is taken out in winter than in summer. The worst time to cut granite is just after a severely cold spell, when the surface is warming to the soft air of a thaw, while the core continues rigid with cold. If attacked then the stone cleaves irregularly, resulting in much waste.

Among the other quarries of Cape Ann may be mentioned that of Mr. Charles Guidet, of New York, and that of Mr. Bartlett, who is in partnership with the Barkers, of Quincy. All these quarries turn out the ordinary gray New England granite.

The most interesting and probably the most important company on the cape is the Cape Ann Granite Company, whose quarries and works are at Bay View. It is capitalized at $100,000, and also owns quarries at East Conway, New Hampshire, and at Jonesport, Maine; the richly colored, variegated granites of those quarries are taken to Bay View to be finished. The president of the company is Colonel Jonas French; General B. F. Butler is said to be interested in these quarries, but we do not vouch for the fact. Both of those gentlemen have elegant summer residences at Bay View.

The company has constructed the largest and best harbor on Cape Ann, exclusive, of course, of the port of Gloucester, and owns some of the ships in which its stone is exported. The number of men employed varies with circumstances, but averages at pre-

sent about 300. A steam railway conveys the granite from the quarries to the cutting works and the docks. This is the only company on the cape having a complete plant for cutting and polishing stone, and a very large proportion of the 50,000 tons it annually ships is finished and ready to be put in place. There is a comfortable business office near the works, and everything about the company's premises indicates thorough system and means generously managed for profitable results.

The granite of these quarries has a straight cleavage, and is generally separated by the well-known Ingersoll steam-drill, which can carry holes to a depth of fifteen to eighteen feet. Groups of these holes are drilled some feet apart, and filled with powder; a cartridge is placed in each, attached by a wire to a common battery, and all the charges are exploded by one electric shock.

Another method is also common when a clean separation is desired. Small round holes are drilled three to six inches in depth and several inches apart. Two slips of iron called half-rounds, and sometimes feathers or buckings, wedge-shaped, but round on the outside, and thickening at the bottom, are then inserted in each hole; a small steel wedge is then placed between the two half-rounds. When all the holes have been thus supplied, a man goes down the line of wedges, beginning at one end, and gives each wedge one smart blow with a hammer. With the last blow, if not before, the entire mass cleaves from the bed-rock with a thin straight fissure reaching down several times the depth of the holes. This is apparently a simple process, and yet it could only occur to one who had long experience in the quarrying of stone.

The Cape Ann Granite Company has furnished stone for many public buildings and important monuments; recently it has supplied some of the granite in the new court-house at Boston. But perhaps its most remarkable success was exhibited in the cutting and moving of the stones for the pedestal of the Scott Monument at Washington. Few people realize the size of those colossal blocks. They are five in all. The four smaller ones measure respectively 20 feet 3 inches in length, 17 feet 3 inches, 17 feet 4 inches, and 15 feet 8 inches. Above them comes the platform, the largest single piece of granite yet cut and put in place in the United States, so far as known. When in the rough it measured 28 feet 2 inches in length, 18 feet 5 inches in breadth, and 3 feet 3 inches in thickness, and its weight was 150¾ tons. When cut and finished the measurements were 26 feet 9 inches length, 17 feet 4 inches width, and 2 feet 10 inches thickness, or 1316 cubic feet, and the weight was 119½ tons.

This enormous mass was taken to Washington by sea. It first had to be turned over in the quarry in order to trim the lower side. This was done by powerful derricks and shoring. It was then laid on a car especially prepared for the purpose, and drawn to the wharf by hydraulic power. But the ends and sides projected beyond the car, and were finished in that position. Supports, cab-house fashion, were then placed under the ends, the car was removed, and the finishing touches were given to the part which had rested on the car. When it was complete it was lifted by hydraulic force and rolled upon a platform prepared for it on the deck of the ship. The men employed in moving this block at Bay View were sent to Washington to place it in position there. Thirty-one men were sometimes employed on this stone each month, although the average was seventeen, representing the work of one man for 2441 consecutive days, or nearly seven years, if indeed one man could have ever accomplished such an undertaking alone.

The next great system of the New England coast granite quarries is found in the Quincy district, Norfolk County, a short twenty minutes from Boston by rail.

The conditions here are altogether different from those described at the Penobscot Bay and Cape Ann quarries. Instead of a few large companies excavating the stone, and finishing and shipping it themselves, we find no end of small companies gathered at Quincy, Quincy Adams, and West Quincy, or scattered about the outlying districts. Quincy Adams has perhaps the largest collection of establishments, and as in a city, there is a subdivision of the labor, one part falling to one company, another to still another association. Thus one company exploits the granite, another cuts and shapes the stone, another planes and turns it, while another furnishes the boxing or the tools. Instead, therefore, of half a dozen great concerns, we see a hundred or more all over the neighborhood, and the entire region rings with the click of the chisel and the hammer. The largest quarrying company is at West Quincy, called the Railway Granite Company. It is capitalized at $25,000, and furnishes the beautiful blue granite so desirable for mortuary monuments. But most of the companies are organized on a much smaller financial basis.

By far the largest proportion of the output of the Quincy quarries is finished on the spot, and thus employment is given there to many skilled artisans, at such establishments as McGilvary & Jones, Craig & Richards, or the Merry Mount Granite Company. It is difficult to say how many men find employment in the Norfolk County granite business, but the number at Quincy Adams and West Quincy is in the neighborhood of 2500 men. This gives one some idea of the magnitude of the operations in that district. One of the chief points of shipment is at Quincy Point, although much of the Quincy granite also reaches the markets by railway.

A visit to the Quincy quarries will give one a clear idea of the methods for getting out and finishing the New England granite, and of the extent of the business. But at Cape Ann, and especially at Vinal Haven, one sees the work performed in the most picturesque and telling manner, showing a centralized combination of effort amid attractive surroundings that give one an imposing impression of skill, enterprise, and vast pecuniary possibilities and results.

S. G. W. Benjamin.

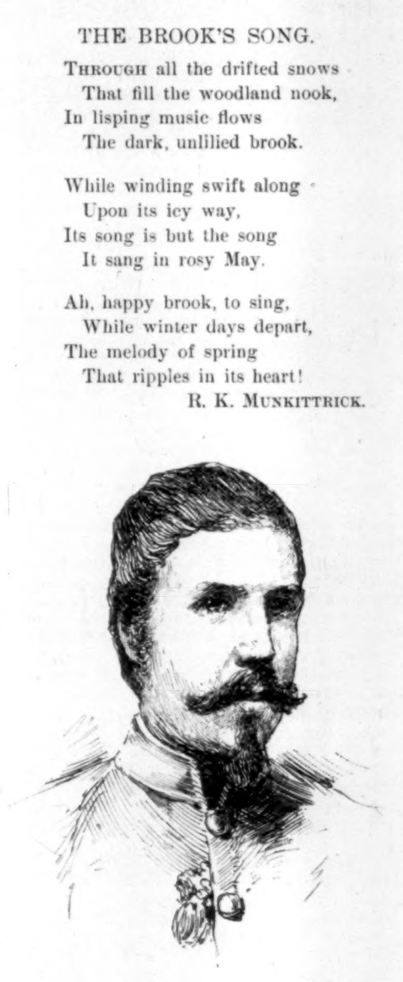
THE BROOK'S SONG.

Through all the drifted snows
That fill the woodland nook,
In lisping music flows
The dark, unlilied brook.

While winding swift along
Upon its icy way,
Its song is but the song
It sang in rosy May.

Ah, happy brook, to sing,
While winter days depart,
The melody of spring
That ripples in its heart!

R. K. Munkittrick.



THE ARCHDUKE JOHN OF AUSTRIA.

BY A CHANOINNESSE.

Although several years have elapsed since I had the honor of receiving Archduke John as a guest at my house during the annual manœuvres in Galicia, yet the acquaintance which commenced there, and which subsequently ripened into friendship at Vienna, enables me to appreciate better than most people the blow which the sorely stricken imperial family of Austria has sustained by the loss of this the most brilliant of all its numerous members. For only his octogenarian mother, the venerable Grand Duchess of Tuscany, appears to retain hopes of ever seeing again that favorite son who sailed from La Plata on July 13th—an ominous date—and who has never been seen or heard of since. The trip around Cape Horn to Valparaiso, which was the port of destination of his fine sailing ship, the *St. Marguerite*, generally lasts thirty days, and occasionally during the stormy season as long as forty-five days. But nearly six months have now elapsed since the Archduke drifted down the Plate River, and vanished into the blue mist which hung around the mouth of that mighty stream. Under the circumstances it is hardly surprising that his ship should have been posted as "foundered at sea." How and where he perished, if indeed he be no longer of this world, is necessarily only a matter of conjecture. But it must be admitted that he really courted disaster; for while at La Plata he found it necessary to get rid of both his second and third officers, while at the very last moment his skipper, Captain Sodick, fell seriously ill, and had to be left behind. The Archduke consequently sailed without a single officer on board, and with a crew recruited from sailors of various nationalities, who were aware that he had a large sum of money, amounting to several hundred thousand florins in specie, on board. He was therefore exposed to more than ordinary risk, and even if his knowledge of seamanship—he held a master's certificate—enabled him to weather the fierce storms which rage during the autumn months around the southernmost point of America, it is quite possible that his crew may have mutinied for the sake of the money on board, and have either put him to death or cast him adrift in a boat. I, for one, shall certainly not feel surprised to hear some day of the Archduke being discovered in the guise of a nineteenth-century Robinson Crusoe, cast away on some lonely island, for everything in connection with this Prince has been impregnated with more or less romance, and an adventure of this kind would constitute a fitting episode—it pains me to use the word conclusion—of his remarkable career.

The Archduke when I last saw him was scarcely what would be called handsome—his features were too strikingly Hapsburg for that—but his face was singularly bright, clever, and interesting, and the kindliness that shone forth from his dark brown eyes, and his smile, were exceedingly winning, when he did not happen to be in one of his sarcastic dissatisfied moods. His dark brown hair was parted in the middle, and brushed slightly forward at the sides. His whiskers and mustache were of the same color. The mouth, with its somewhat thick lips, was thoroughly Hapsburg, but the nose was distinctively Bourbon—a fact probably due to his mother being a Princess of the Neapolitan Bourbons. She is a sister of the late Empress of Brazil, of the late Queen Christina of Spain, and of the Comte de Chambord's mother, the famous Duchesse de Berri. The Archduke's handsome and elegant figure was set off to perfection by his uniform of Lieutenant-General, and his whole appearance gave one the impression of mental and physical activity and power. Indeed, he seemed to have been endowed by some fairy godmother with every conceivable talent. His military genius and attainments have been described by the most competent critics of the day as being of an extraordinary nature; and some of his treatises and pamphlets on matters connected with the army—notably one entitled "Drill or Education"—have had the effect of almost revolutionizing the War Departments both at home and abroad. To a profound knowledge of chemistry and of other similar sciences he added the somewhat incompatible gift of poetry; and several volumes of really beautiful poems have been published by him under the pseudonyme of Johann Orth—a name derived from the Castle of Orth, which was his favorite residence, on the Gmunden Lake. As a musical composer, too, he acquired considerable fame. Two of his waltzes were played and danced to throughout the entire carnival of 1882 at Vienna; and a ballet which he composed, entitled "Die Assassinen," has frequently been performed at the Imperial Opera. He played exquisitely on the zither; and nothing used to delight me more than when he would seat himself at my piano and allow his fingers to roam over the keys, calling forth the strains of some sweet and plaintive Kaernthner Lied, or of some thrilling Tsigane melody, which floated through the air, and out through the open windows into the twilight outside. His manners toward women were marked by all the chivalrous courtesy which is traditional in the Hapsburg family, while in his dealings with men he was ever ready to forgive an injury, or to make amends for any display of his somewhat quick temper. With regard to his nobility of character in this respect, the best illustration that I can give is his behavior toward Major von Daaba, one of the cleverest officers of the Austrian army, who was dismissed by the Emperor from active service as a penalty for the particularly bitter and sarcastic treatise which he published in reply to one issued by the Archduke, his superior officer, on the subject of heavy ordnance. Aware that the Major possessed but little beyond his pay, he sought by every means in his power to provide for his maintenance, and finally secured him a lucrative position as the personal aide-de-camp and equerry of the wealthy Prince Ferdinand of Saxe-Coburg, now ruler of Bulgaria.

An impression appears to prevail among the public that the Archduke's loss of his titles, rank, and honors constituted a punishment by the Emperor for some peculiarly flagrant act of impropriety and misconduct. This is far from being the case. His renunciation was a purely voluntary act, and was repeated several times before the Emperor could finally be induced to grant his consent. It was a project which he had conceived years and years ago, and I can recall to mind that he discussed it in my presence as far back as 1880. Only those acquainted with the terrible severity of the ancient Spanish etiquette which prevails at the Austrian court, and which stifles every independent sentiment and feeling under mediæval precedent, will be able to appreciate the bitterness with which the exasperated Archduke was wont to lament his exalted birth, and to yearn for a humbler rank in life, which would enable him to lead an untrammelled existence, and to devote his energies to the work most congenial to him. In no army in the world do more antiquated prejudices exist than among the old Generals at the head of the Austrian army, who find their principal support in the venerable and charming Archduke Albrecht, the victor of Custozza, and octogenarian Generalissimo of the imperial forces. All the enlightened and progressive ideas of the young Archduke were gall and wormwood to the dear old gentleman and to his white-haired followers, among whom the conviction prevailed that Prince John was a dangerous character, who required an unlimited amount of snubbing and repression. The Archduke was not slow to realize this, and was perhaps a trifle indiscreet in the loudness of his complaints about the manner in which he was prevented from applying his talents to the service of his Emperor and of his country.

"I did not become a soldier," he would exclaim, "merely for the sake of having a sabre clanking at my heels, or for that of riding in a brilliant uniform among the Emperor's suite at the reviews. I want to feel that I really earn my pay as General. I do not wish to be looked upon as a mere uniformed idler."

It was probably this ardent desire to escape from the trammels by which he was hampered on every side that led him to seek a fresh field for his energy in Bulgaria, where he first offered himself as a candidate for the throne left vacant by the abdication of Alexander of Battenberg, and where he subsequently applied to Prince Ferdinand for the chief command of the Bulgarian forces. Both of these political indiscretions caused dismay and inconvenience at the Viennese Foreign Office, and likewise gave much offence to the Emperor. But the latter, with his usual kindness of heart, soon forgave his wayward young cousin, whose education he had superintended, of whose talents he was proud, and who as a boy had been his particular favorite. Nor was any one of all the members of the imperial family more affectionately received by his Majesty than the Archduke John at the memorable assemblage of the Princes of the reigning house, which took place on the day of the funeral of the ill-fated Kronprinz Rudi.

Archduke John is the youngest son of the Grand Duke Leopold II. of Tuscany, and was born in 1852 at Florence, which in those days was the capital of his father's sovereignty. Seven years later he accompanied his parents in their precipitate flight to Vienna, and was old enough to observe and to remember the grief with which his father witnessed the incorporation of his dominions in the kingdom of Sardinia, and the confiscation by Victor Emmanuel of the priceless art treasures contained in his superb Pitti Palace and Uffizzi Galleries on the banks of the Arno. It is worthy of note that although thirty years have elapsed since then, the seizure of the Grand Duchy has never been recognized up till now by the imperial government. For notwithstanding the intimate relations which have been brought about between Austria and Italy by the triple alliance, the dispossessed ruler, Leopold II., continued to be recognized at the court of Vienna as the reigning sovereign of Tuscany until the day of his death, in 1870, when his eldest son, the brother of Archduke John, was recognized in a similar manner as his successor under the style of Grand Duke Ferdinand IV. of Tuscany. It is as such that he figures even to this day at all court and official ceremonies in Austria.

His younger brothers, including Prince John, who rank as Imperial Highnesses and as Archdukes by reason of the membership of the House of Hapsburg, have all three seen active service in the Austrian army. Charles, the eldest of the three, is the father of young Francis Salvator, who married the Emperor's favorite daughter, Marie Valérie, last summer. Louis, who comes next in point of age, resembles his younger brother John in his intense aversion to the trammels and restraints of official life and court etiquette in Austria. Many years have passed away since he has been seen at Vienna. He lives almost all the year round in a fairy-like château which he has built for himself in the island of Majorca, where he was recently visited by Empress Elizabeth. Passionately fond of yachting and an accomplished navigator, it is reported that he is about to undertake a long voyage around the coast of Patagonia and among the islands of the southern Pacific, for the purpose of seeking traces of his brother. The Emperor has placed one of the government cruisers at his disposal for the purpose, and he is expected to sail from Trieste for South American waters within the next few days. It is probable that in the course of his exploration he may touch at the island of Juan Fernandez, once inhabited by Robinson Crusoe, and now tenanted by a former Austrian officer, Baron von Rodth, who, after being forced by the terrible wounds which he received at the battle of Sadowa in 1866 to leave the army, grew tired of the monotony of existence in civilized Europe, and determined to devote his fortune to a life of adventure. For fifteen years past he has been living on the island of Juan Fernandez with a small colony of natives and of European deserters from civilization, and only communicating with the world once a year, when he sends his fine sailing yacht to Valparaiso for provisions and supplies. It is not altogether impossible that if the Archduke Louis visits the island he may find his missing brother John living there with Baron de Rodth, for I cannot help thinking that he had some scheme of the kind in view when he wrote to a friend, just before sailing from La Plata, that many, many months would pass before he would be heard of again. Meanwhile his disappearance will remain as romantic as would be his discovery on some lonely island. Indeed, it is the only case in the history of the world where the scion of one of the great reigning houses has so vanished without leaving any trace.

FARMING.

XIX.

I HAD but a week longer to linger in the Dove's Nest. At the expiration of that time I would have to take wings unto myself and fly back to the flat, which, in contradistinction to Dove's Nest, we called, but not sarcastically, a set of pigeon-holes.

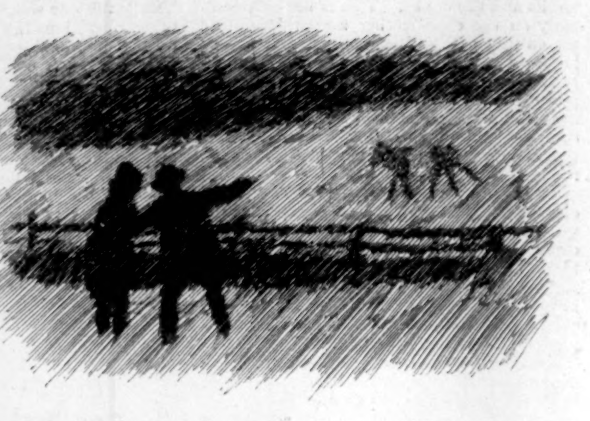
Even as enthusiastically as we had looked forward to the country, we now looked forward to the city, and when we were not looking forward to it, we were looking backward at it, and longing for the time when we should renew its acquaintance. From the picture of the cows wading in crystal brooks I looked to that of the condensed milk man driving up to the door and delivering unto us any quantity desired, while the dealer had the condensed cows to look after in health, and to care for in sickness.

When I reflected on the tramp to Cranberry Corners to catch the train, which, if I missed, I could not catch until the morrow, it seemed a real luxury to be half a paved, lighted block from the "L" road with such a goodly service.

It seemed actually strange to me that my views should change so; that I could see so much good where I once could see only evil; that I could note so many drawbacks in a region which I at one time had regarded only as an earthly paradise. Every trick in the city I could match with one in every respect bucolic. In the city the janitor becomes enamored of and purloins your coal; in the country a man will come without so much as a letter of introduction, and help himself to your cord-wood and poultry.

While thinking of many other arguments to justify my new move, and while wondering how a man with the refined songful soul of H. Q. Flaccus could have contented himself on a farm, even on the classical Tiber, Phillada announced that she had commenced the packing, and commanded me to stop dreaming my dreams about burying cabbages and unearthing turnips for the winter, and come to her assistance. This fiat I respected with alacrity, not because packing for a move is one of my several weaknesses, but because I did not want a repetition of her last unaided effort in the same direction. I will not make more than a passing comment on the same, trusting that that may account for my ready response to the summons to lend a hand. And that passing comment is to the effect that she packed too omnivorously, if I may so put it, to agree with my ideas of what consistent packing should be. I do not pretend to boast a knowledge of the deeper mysteries of this art, nor to possess even a superficial notion of its requirements, yet I feel that I was not unreasonable upon the occasion of our arrival at Dove's Nest when I spoke disparagingly of the bump of order of the fair packer, who had indiscriminately mixed tin-ware, crockery, clothing, and food, when I discovered that a salt codfish was encompassed by my dress-coat, and that my silk hat was rudely forced out of shape by having had a ham forced into it.

That night, when we sat before the blazing logs, we felt happy in every sense of the word. We had tried an experiment without realizing a long-cherished dream. But we felt that our experience would tend to make us better satisfied with our less roomy quarters in the city. We had a long list of things we intended doing on our return, especially in the way of amusements calculated, figuratively speaking, to remove the hay seed from our hair, and introduce us once more to the refinements of civilization.



We stood looking out of the back window across the snow-clad fields. As the only light in the room was that of the sputtering logs, we could see far into the whitened distance. There was a dreary sweetness about it that gave me a pang of regret at leaving, despite the fact that I had never known real suffering before occupying Dove's Nest.

I think Phillada felt the same, for she uttered not a word until she broke the silence with, "Who's that coming over the hill so fast?"

I looked, and saw a man running at full speed in the direction of the house. It was rather a misty night, for it was snowing, and everything was dead white, which made the man's figure very distinct at quite a distance, while a white house a short distance down the road could not be seen at all.

Nearer and nearer he came, until I could identify him as our new wage or rather board worker by his great mass of red whiskers.

He never paused in his flight until he reached the room where we were looking out on the dreary fields.

I will not attempt to give his words, but will simply say that he was in a state of fright bordering on madness. Just over the hill he said he saw the hinder legs of a black cow chasing the forelegs and head of another black cow. That no matter how fast or how slow the forelegs travelled, the hinder members would always remain at the same distance. When the head would toss itself in the air, as though maddened by despair at not being able to escape, the tail would whip the air in precisely the same frenzied spirit. And as frantic as the head became because it could not throw the hinder legs off the trail, just as frantic would the tail become because of the inability of the hinder members to capture the head. When he left he said they were standing perfectly still, neither being able to gain on the other.

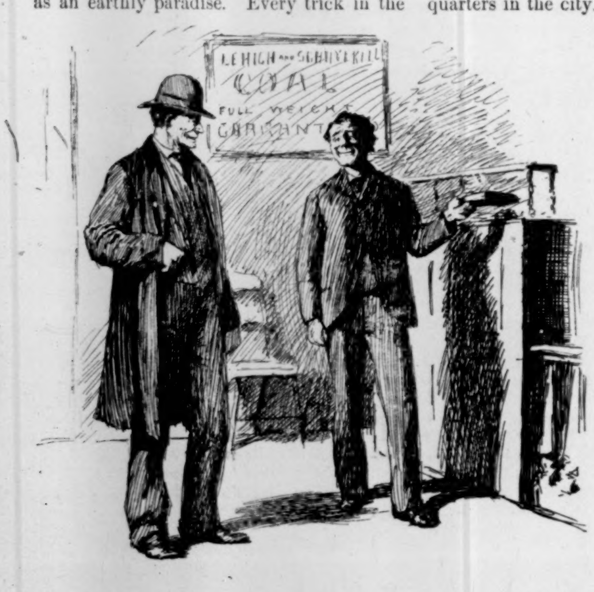
"Was that story all to gain a rest by the fire when you should be carrying in wood?" I asked.

He not only denied that this was his motive, but insisted on my going with him to see that he was not fabricating. On my return I had to laugh until I was helpless.

"What was it?" asked Phillada.

"Van Sickle's Holstein-Frisian cow," I replied. "The surroundings were so white and snowy that he could distinctly see her black head, legs, and tail, but could not discern the broad white band about her body at all."

R. K. MUNKITTRICK.



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THE CLEANSING OF GREAT CITIES.

BY G. T. FERRIS.

As the world grows older it becomes not only conscious of new problems which it has to solve, but it becomes more keenly conscious of the importance of old ones which it has only imperfectly met. Among these are the questions involved in municipal government. This differs from national government in that the objects to which it addresses itself are much more direct and practical. They come home closely to a man's heart and hearth-stone, to his daily health and comfort, and they closely affect the surroundings made up of a multiplicity of little things in which, after all, his happiness consists. Yet, strange to say, the average American is vastly more interested in the tariff issue or the "Force Bill" than he permits himself to be, for example, in adequate methods for keeping such cities as New York, Boston, and Chicago in a clean and healthy condition.

It is not necessary to enter into any argument as to the causes of this. It cannot be denied, however, that concurrently with great increase of theoretic discussion as to rights and duties involved in city government, there remain the same fatal listlessness and indifference in backing up and enforcing statutes for the benefit of the citizen, on the part of the citizen himself. Law, unless it is made vital by energy of public sentiment, is not worth a fillip. In the United States it seems to be true that the larger the city the less that enthusiasm which we call public spirit. The easy-going good-nature of the American, *par excellence* the New-Yorker, in the endurance of nuisances which have finally grown to be chartered abuses is notorious. We laugh at the incessant grumbling and self-assertion of the Englishman. Yet it is to that very spirit, odious as it may sometimes be, that the American owes, when he goes to London, that order and smartness in public aspects which he is accustomed to do without in his own dearly beloved, badly governed, and slovenly metropolis. Newspapers, to be sure, keep up an intermittent fusillade on the subject when necessary to find material for their editorial or news columns, but frequently with as much intelligence as in the case of dogs baying at the moon. The fact is, there is abundance of law wherewith to smite public nuisances hip and thigh; but no complainant ever seems to come to the fore, except some sporadic policeman, inspired, he knows not why, with a sudden and inexplicable frenzy of zeal. The average citizen, accustomed to endure nuisances as a humpback carries his deformity, saunters along sublimely indifferent to foul smells, obstructed sidewalks, filthy streets, etc. "Oh," he says to himself, "this is the business of the police. I can't waste my time making complaints, and taking the chance of going to court as prosecuting witness. Growling does not put one penny into my pocket." The merchant, intent on reaching his office, cares not a whit if some handcart vender empties a load of rotten fruit or vegetables into the public thoroughfare, or a house-maid discharges a pailful of slop or garbage under his very nose. Wealthy shopkeepers permit their clerks and porters to sweep a day's accumulation of litter and dirt into the street gutter, which is straightway blown about the street and added to the burden of the street-cleaning burden. It is owing to the utter limpness of public feeling that municipal action is not more efficient. No stream can rise higher than the level of its source. When the citizen is forced by sense of duty to become an amateur policeman, and looks stringently after his interests as involved in the enforcement of law, then, and not till then, will ability, conscience, and vigilance show themselves in civic administration. This is the great evil of all for the public press to attack, and assault on details is like hewing at the branches instead of the root.

Nothing is more essential to individual health than bathing. The removal of dirt and filth from a great city is just as essential as the cleansing of the pores of a man's skin. In few cities is this adequately accomplished, Paris and London perhaps reaching the ideal among the world's great capitals more nearly than in other cases. According to the testimony of foreigners and Americans alike, the leading cities of this country do not compare favorably in street-cleaning methods and results with the corresponding cities in France, England, and Germany. In Holland, Belgium, and Sweden civic cleanliness is carried to a higher degree than in any other part of Europe, but the cities are very much smaller in extent and population, and the problems to be met are less difficult to solve. Neither are there large foreign colonies, with alien and unsympathetic habits, to complicate the problem of keeping a city clean. In European cities, too, an intelligent Cæsarism is sometimes possible in directing municipal affairs, which under an American system cannot exist.

In this country it is not easy to decide which of the great cities is the most filthy. All of them claim this unsavory pre-eminence from time to time. Now and then the public prints of New York will, with furious energy and great affluence of polished Billingsgate, denounce that city as the most illy cleaned city of the country, and therefore of the civilized world. Then a Chicago journal will echo the self-accusing cry, and lash its own community with the same indictment. Again Philadelphia or St. Louis newspapers will use the scourge with pious zeal, just as a mediæval monk was wont to scarify his bare back when a specially holy enthusiasm slipped the leash. Between such cries of "peccavi" it is difficult to make a choice. It is safe to conclude that all these rivals for the palm of uncleanliness are vile enough, and much worse than they ought to be.

On the whole, as New York is the biggest in everything else, both for good and evil, it is fairly safe to conclude, for the purposes of this article, that she easily surpasses her would-be competitors in dirt. She certainly has the largest foreign population among the cities of the land. This fact alone suffices to insure prominence for filthy streets and tenement-houses reeking with stench and grimy with "matter out of place." The writer of this article was recently driven through the Italian quarter by a city official on a tour of inspection. The Italian peasant who in the United States blossoms into the organ-grinder, the rag-picker, and the railway navvy is probably the dirtiest human animal extant this side the Australian bush. He is the intensive term in the scale of values. A city filled with such denizens, and their nearest rivals, Russian or Polish Jews or Bohemians, could only be properly cleansed as Hercules cleansed the Augean stables, or as Carlyle proposed to cure the evils of Ireland by burying it deep under the Atlantic. Who can adequately photograph Mulberry Street, the woes of which, from the street-cleaning point of view, if more extended would soon turn gray the hair of any commissioner?

This district is as picturesque as it is foul and unhealthy. The day before it was seen by the writer it had been flushed with water, and thoroughly scrubbed with the sweeping machine. Twenty-four hours had again made it a human pigpen. The pavement was covered with a thick coating of what seemed grease. A profuse litter of orange and banana peel, withered cabbage leaves, vegetables in different stages of decomposition, and various garbage was scattered over the street. The intense heat of the day had emptied the tenements, and the population lined the sidewalk on full parade, largely in uniform similar to that of the Georgia major—a collar and a pair of spurs. Nearly all the multitudinous babies were naked, and the mothers, almost nude, suckled their young with the unconcern of the bitch feeding a litter of puppies. A barricade of handcarts on either side made the street a narrow strait, and swarthy men lounged about smoking lazy pipes, while brown monkeys of solemn and weazened face, looking much akin to their masters, wandered about much at home in the chattering crowd. Could some of the babies have been well scrubbed, they would have been as beautiful as cupids, but the stones themselves were not dirtier than the skins of men, women, and children, whose olive was made doubly and deeply tawny. The disreputable shops swarmed with millions of flies, and the doorways and casements of every house were stained almost to ink with the accretion of smut and pollution coming from foul bodies, foul air, and foul insects. The stenches of the street could not have been sweetened by all the spices of Araby the Blest. It is a wide range from the better parts of Fifth and Madison avenues to Mulberry Street, the Ghetto of New York, but the average condition off the lines of the great thoroughfares, one fears, is, in warm weather, more approximate to the latter than to the former extreme.

An examination into the methods of street-cleaning used in the three representative cities of modern civilization—London, Paris, and New York—the conditions which embarrass the problem, and the comparative results obtained, will perhaps throw some light on the question which is now perplexing all our large centres of population.

It is only within the last century that the value of systematic street-cleaning has made itself felt as a need of civic administration. The Romans, most practical of the ancient peoples, though great aqueduct and road builders, seem to have cared but little for cleanliness in the city highways, though nominally this was a part of the duties of the ædiles. Those most frequented by the patrician classes were, to some extent, purged by servile labor, but there seemed to be no keen sense of the connection between scavengering the public ways and sanitation. Juvenal, in one of his satires, makes bitter complaint of the condition of the streets, and tells us that it was only less filthy than the morals of the Roman ladies. The mediæval cities of Europe fairly reeked and stank with an indescribable accumulation of everything that was nasty, if we can trust the somewhat scant contemporary records bearing on the subject. The plagues and pestilences which so often ravaged European cities found good feeding-ground; and Machiavelli, in his account of the great Florentine plague, the Black Death, alludes to the foul condition of the streets. Pepys and Evelyn, who give such a vivid account of the England of Charles II., often refer to the noisome accumulations of the London highways; and Daniel De Foe, in his *Journal of the Plague of* 1665," one of the most graphic and realistic of narratives, calls attention to the same thing as one cause connected with the ravage of the pestilence.

The other branch of the purgation of cities—a system of sewers—has engaged the attention of governments from an early date in civilization. The most ancient cities of the world have shown us in their ruins the remains of sewers on a magnificent scale. The *Cloacæ* of Rome, originally planned in the early days of the republic, lasted through imperial times, and the great sewer the *Cloaca Maxima* still remains in part and answers its function, so massive and perfect was its structure. Paris sewers were planned as early as the fourteenth century, though it was not till the early part of the present century that the system, by order of the first Napoleon, was reconstructed into one of world-wide repute.

It is somewhat singular that offensive accumulations above-ground should not have impressed public or official attention as dangerous to health as well as repulsive to the senses till a comparatively recent period, though the priority of interest in the subject of sewerage is not a fact difficult to explain. One can readily understand, however, that street-cleaning was not very practicable on a large scale till an adequate system of street-paving came into vogue. This was the hinge on which the whole problem turned.

It is perfectly true that the paving of city streets is nothing new. Scientific road-making was practised very successfully by the Romans, those past masters of all the practical arts. Aside from the magnificent roads built with military and political ends in view, such as the Appian Way, the Via Domitiana, and the great highways the remains of which are still found in France, England, and Germany, the streets of the Latin cities were more or less paved. Lava block pavements with ruts worn by chariot wheels are still to be seen in Herculaneum and Pompeii. The important streets of Rome were thoroughly paved on the same system which governed all their road-building. Over several courses of broken stone and rubble cemented with lime were laid large polygonal or rectangular blocks of stone, the edges of which were fitted with the greatest nicety. Though such matters passed into decadence during the Middle Ages, the paving of cities was irregularly carried on. Cordova was paved under the Moorish *régime*, a few Russian streets were paved in the latter part of the twelfth century, and London, by the middle of the sixteenth century, had many of its principal ways rudely cobbled. But the attempts were so carelessly and spasmodically carried out, and so unskilfully designed, that the effect in decreasing the foul condition of ciites was but trifling.

It was not till the early days of the present century that systematic and careful paving of city streets on a great scale began to be practised. Trésaguet, in France, who labored about a hundred years ago, and modified ancient Roman methods to fulfil modern needs, and, a quarter of a century or so after, Telford and Macadam, in England, were the reformers who presaged all improvement in this direction, and laid civilization under a permanent debt. At the risk of trenching slightly on ground so admirably covered by Captain Francis V. Greene, of the United States Engineer Corps, in his article on "Roads and Road-making," in HARPER'S WEEKLY of August 10, 1889, a brief review seems needful, in view of the essential connection between paving methods and street-cleaning. Both Trésaguet and Telford used the system of laying heavy stones at the bottom of the road-bed, and covering them with a coating of broken stones. The foundation consisted of stone blocks on an arched bed. The road metal, as the filling is technically called, consisted of stones not more than two inches and a half in diameter. Macadam denied that the Telford foundation was necessary to good drainage, and used a crust of angular broken stone of nearly uniform size, and weighing about six ounces, which were laid directly on the ground even in marshy spots. There still continues to be a divided judgment among engineers as to the merit of the two methods. Captain Greene briefly summarizes the present application of the two methods to road-paving:

"Macadam roads are now everywhere constructed on substantially the same principles. The ground is first cleared and levelled of the prescribed width, and, if necessary, excavated to the depth of the road-covering. All roots of trees, and soft and spongy spaces not affording a firm bearing, are removed, and their places filled with good gravel or broken stone. The surface is then rolled with a heavy roller in order thoroughly to compact it. If the Telford foundation is used, it is placed on the rolled earth in the form of irregular stones from six to eight inches in size, carefully placed in position and forming a rough pavement, on which the macadam metal is placed. If the Telford foundation is not used, the metal is placed directly on the earth, in a uniform layer not exceeding six inches in depth. This is then thoroughly compacted by rolling with a heavy roller for several hours, until the metal will not yield under the roller. Another layer of broken stone of the same depth is then placed on the first and compacted in the same manner. Finally a layer of from one to two inches in depth of very fine broken stone or gravel, not exceeding three-fourths of an inch in largest dimensions, is spread on the surface, and this in turn is compacted by rolling. The road is then ready for use." What is often called a macadam road is partly made on the Telford system. The street pavements of London and Paris are still to some extent built on the Macadam or Trésaguet-Telford methods, or a combination of them. In the provincial cities of both Europe and America they are widely used, but the tendency everywhere is to substitute a more durable and *easily cleaned* pavement, specially where there is heavy traffic. Yet it may be justly claimed that all good city paving to-day is the logical outcome of the general principles laid down by Telford and Macadam.

In great cities the problem of efficient and economical cleansing must necessarily enter into the *pros* and *cons* of paving methods. Aside from greater durability, ease of traction, and economy of maintenance, granite blocks, asphalt, and wooden blocks have proved to be most desirable for ends of cleanliness. All three of these methods are used in Paris, the preference, however, being given to asphalt wherever practicable. In London, while granite block pavements are common, asphalt and wood are very frequently the paving material. In New York the asphalt experiment has been and is being made, but somewhat unsatisfactorily. The granite block pavement is nearly universal, and it is hardly worth while to consider any other in its relation to the street-cleaning problem.

The advantages on the side of cleanliness are all on the side of asphalt. Its unbroken water-proof surface affords broom and sweeping machine the best possible opportunity for effective work. Block pavements, either stone or wood, are, on the other hand, everywhere broken with joints. Here are continually gathered horse droppings, urine, dirt, and all manner of street filth; and the joints at the best can never be perfectly cleaned. This evil is aggravated tenfold by criminal carelessness of method in laying and maintaining the stone pavements of New York. Perhaps this reproach lies, indeed, rather with the latter than with the former. It may be assumed that the Public Works bureau insures through its inspectors, who may be supposed to be superior to petty bribery, a reasonable degree of thoroughness on the part of the contractors to whom street paving is let on the principle of the lowest bid, which is not always sound economy.

When, however, we look at the question of maintenance, it is not needful to assume or take things for granted. Any one who uses his eyesight can reach only one conclusion. The pavement after some years becomes full of ruts and holes, resembling a honey-comb, but not full of honey. These, instead of being constantly repaired, are for the most part ignored. The Board of Public Works disdains patchwork. When we add to this the constant tearing up of the pavement by private corporations, to whom permits are so recklessly granted, and their audacious carelessness of reconstruction, which seems to be superior to restraints of inspection, we may conclude that the maintenance of pavement in New York is about as bad as possible. How any street-cleaning machinery can keep such thoroughfares clean is difficult to see. A good pavement needs incessant watchfulness after it is laid. In London, Paris, Berlin, and other European cities this vigilance of repair is always exercised at least on the important thoroughfares of business and pleasure. It is a well-known fact, also, that dirt in large quantity works up through the crevices of the blocks from the road-bed unless the greatest care is taken in making and maintaining the pavement. It is safe to assume that among the difficulties of street-cleaning in the cities of this country as compared with those of Europe, bad paving methods constitute not the least formidable impediment.

Street-cleaning in the metropolis of London has been the subject of study and experiment by the ablest English engineers, and, on the whole, with excellent results, partly due, perhaps, to good administration utterly divorced from that bane of American municipal life, politics. The metropolis is divided into various parishes or vestries, of which the city of London is the chief. So there is by no means uniformity of method, though the tendency is more and more in this direction.

The cleansing of London City belongs to the department of the Commissioners of Sew-

ers. The head-quarters of operations is at Lett's Wharf, on the south bank of the Thames, just east of Waterloo Bridge. This is the great receptacle for the sweepings and refuse of the city, and here is an elaborate plant, including the most approved appliances for gathering and dealing with the waste and filth of the great net-work of streets. The force employed consists of about 500 men, women, and children. There are 80 horses, 70 dust vans and water-carts, besides carts for the removal of diseased meat, dead animals, etc. The variety of brooms, hand and mechanical, scrapers, squeegees, and other tools suited to all weathers and street conditions is nearly endless. The night brigade begins the work which cannot be done in the daytime at eight o'clock. Six hours later the vanguard of the day section commences the washing and sweeping of the twelve miles of main thoroughfare. At 5 A.M. the regular day work begins, during which all the carriageways of the city have to be swept at least once, in addition to being strewn with sand or gravel. The carts for the removal of sweepings and house dirt leave Lett's Wharf at 6 A.M., and at 7.30 the boys, who are the skirmishers of the great street-cleaning army, divided into four companies under the charge of inspectors, scatter over the four districts of the city. All street sprinkling is done by the regular city force, and is regulated to meet the exact needs of the work. It is regulated on the principle of aiding to remove dirt, not of making irremovable mud, as is the effect for the most part of street-watering in New York. Streets are also washed down from the hydrants whenever necessary. In brief, the application of water as a feature of street-cleaning is made on a scientific method.

From 6 to 9 A.M. the whole energy of the force is employed. After this the night brigade retires, and the work gradually relaxes, for it has been principally achieved. At 4 P.M. the men and carts are at home, and an hour later the boys are back in Houndsditch. That London City, the cleanest part of the metropolis, attains this distinction is largely owing to the work of the boys, the street orderlies. These lads, who number about 150, armed with hand brush and scoop peculiarly devised for the purpose, dart everywhere in and out through the press of horses and vehicles. The duty of each is to remove every particle of dirt, especially horse droppings, in the area assigned to him before it has been ground by a wheel. Bins at the street curb receive the gatherings. It may be fancied that the duty of the street orderly is no sinecure, and the marvel is that these human monkeys, agile as they are, do not oftener receive serious hurt. They do their work most effectually, and the operation of the system is such as to make it valuable for general imitation. What can be done in this way the New-Yorker may see in the private enterprise of shop-keepers on Broadway between Seventeenth and Twenty-third streets, who employ street orderlies to keep the thoroughfare free from manure and litter. Not only more important streets, but minor ones, courts, and alleys are looked after by the orderly boys. These boys, as they reach manhood, are promoted to positions in the dust yard, or on the destructor, or become broommen, van drivers, or even petty officials; and when they attain old age, after faithful service, they are pensioned. They are lodged and fed by the city, at the expense of a certain deduction made from their wages.

Variation in method, of course, has to be applied to cleaning pavement according as it is block or asphalt. Difference in weather, too, causes difference in tools. The squegee, for example, which is a slip of India-rubber set in a slide and provided with a long handle, is most effective in cleaning slop and mud, wiping pavement as clean as a towel would. This instrument is invaluable in washing asphalt. Great care has to be taken during winter as to how the asphalt pavement is cleaned. A little too much water would leave a film of ice, and the result would be dangerous. Every branch of the work is done under the charge of an inspector or foreman. The barometer at Lett's Wharf is anxiously watched evening and morning, and its prophecy determines largely the work of the next twelve hours. The collection and removal of house refuse and office rubbish are effected before eight o'clock in the morning. The total quantity of refuse from the City delivered at Lett's Wharf increased from 50,054 tons in 1871, to 61,239 tons in 1880; and it was estimated that the amount last year (1889) was about 65,000 tons, each load being estimated at about a ton in weight. The ratio of house, trade, and market refuse to street sweepings was 38,000 tons to 27,000 tons.

The great mass of accumulated rubbish is sorted in the dust yard. About seventy women are employed in this work. Standing in the midst of fine dust piled up to their waists, with face and upper extremities begrimed with refuse, they breathe the warm, foul, stench-laden air from early to late. The first segregation of material is through large circular sieves, which divide it into fine dust and the coarser elements. Of the latter, all the articles which have a commercial value—such as unburned coal and clinkers, bottles, old metal, crockery, paper, corks, bones, rags, string, etc.—are sorted into distinctive heaps. All this work is done under the charge of a general contractor, who is paid by the commissioners, and who also takes the more saleable articles. The city retains the breeze, soft core (garbage, etc.), and hard core (worn-out pots and pans, broken bottles, and crockery, etc.). The breeze or dust and the ashes are sold to brickmakers; the hard core is broken up and utilized in road-making; the garbage is cremated in the destructor with other useless material; and the manure gathered by the orderlies is sold to market gardeners and farmers, who remove it at their own expense.

The destructor is a set of furnaces in which all offensive and worthless matter is burned up. Mr. Fryer, the inventor, describes it as a form of furnace designed for the reduction by fire of substances that contain only a small portion of combustible material. The top is a flat platform, with an opening over each cell for the admission of matter to be burnt, which is directly shot in from the carts. Without entering into any more detailed description, it may be said that the furnaces are fed by a strong air blast, and that one of six compartments (the usual size) will consume 13,104 tons in fifty-two weeks of six working days. It is claimed that by means of the destructor the reduction of mixed matter is effected to the extent of from four-fifths to six-tenths; so that for about six loads of more or less offensive matter which had to be previously carted or boated away, only one load of desiccated material has to be handled.

Yet, with all this care and ingenuity, the final disposition of refuse in London is a very serious problem. A vast amount of it —indeed, the greater bulk—is positively unsaleable. The brick manufacturers of the Medway receive much of it in their barges, which is supposed to be taken back in ballast. But the Inspector of Fisheries reported that in 1887 37,500 tons were dumped into the Thames from the barges surreptitiously by these country bargemen, and by London men who were dust contractors and barge owners combined. The great difficulty in London is not in the cleaning of the streets. This, on the whole, seems to be admirably accomplished. The problem is to get rid of the rubbish.

Mr. Thomas Codrington, the engineering inspector of the local government board, who was instructed to report on the disposition of town refuse last year, said, among other things: "Town refuse, consisting of the contents of ash pits and dust bins, market and trade refuse, and the sweepings of paved streets, includes materials which, when sorted out and separated, may yield a small return, or can be utilized in some way. But this part of the refuse has, from various causes, lost much of whatever value it formerly had, and the sanitary objections to the handling of an offensive material for the sake of a small gain are now more generally recognized. It has also become more and more difficult to get rid of that part of refuse which is absolutely worthless. The practice of filling up pits, quarries, and hollows with materials containing offensive and putrescible matters, sometimes afterward to be built on, is now properly condemned on sanitary grounds, and town authorities, when places for deposit within their own boundaries are no longer available, find neighboring authorities more and more averse to allow refuse to be accumulated within their district. The disposal of town refuse has thus become almost everywhere a troublesome question."

The prices possible to be obtained for sorted material, manure, and the animal or vegetable charcoal into which the garbage has been sometimes made by the carbonizer have become gradually less. The balance of receipts over expenditures in the city of London for the treatment and disposition of town refuse, was reduced from £2366 in 1876 to £476 in 1880, and it seems from such indications as can be had at the present time that it is now a steady item of expense. Were London as near the sea as New York or Liverpool, it is probable that city refuse would be disposed of in the same fashion as in the two latter-named cities, with some slight modification.

We have thus far spoken of London City, which has the best system and is the most thoroughly cleaned section of the metropolis. The forty parishes making up London the great are all managed by local authorities, and there is some divergence in street-cleaning administration. Yet all copy in marked degree after the City, and as a standard of comparison, the one already sketched may stand for the rest. The main difference is that while London City owns its own plant, and employs all its own street-cleaning force from highest to lowest, except the sorters in the dust yard, other parishes are more or less hampered by the vicious contract system. The completeness of its plant, and the perfect discipline and control of the employés of the department, are the main factors of success. The only use of contractors, aside from the disposition of the contents of the dust yard, is at times of extraordinary pressure. There are a certain number who are under bond to furnish a specified number of horses and carts when called on. This need, however, rarely occurs, except in case of very severe snow-storms, which do not often occur in London. All the annual reports of the different parishes show how keenly the evils of the contract system are felt, and avow the determination to reach the goal of ownership in the case of the street-cleaning plant, and direct employment in the case of labor, as soon as possible. Battersea, Hampstead, Mile End, and Whitechapel use destructors, while other parishes pay contractors to do all the work of street-cleaning and disposition of the refuse. Again, in some cases, the local board pays for sweeping and collecting, and the carting is done by contract. It is not needful to enter into further details. Our object has been served in calling attention, for future comparison, to the methods of the City of London, which, before many years, will probably dominate the whole metropolis. The cost of gathering and disposing of its refuse to the metropolis of London, which may be estimated at 5,500,000 population, is about £320,000 a year. To accomplish its work it has a park of 1500 dust and water carts, 300 mechanical sweepers, a brigade of over 3000 men, and a fleet of 150 barges, aside from what is contributed under contract. It is claimed that, as between the different parishes, it costs the City one-third less proportionately to do a work which is much more perfect than in the case of any other part of the metropolis.

The cleansing of Paris was formerly a function of the Prefect of Police (as was also the fact as to New York), but is now in the department of the Prefect of the Seine. The staff consists of two engineers, one for each group of arrondissements, one being subdivided into three sections, each under the charge of an executive engineer, and the other into five sections, similarly supervised. The sectional engineers have under their charge 51 superintendents and 61 overseers, whose employment involves a cost of 260,000 francs. The scavengering plant is stored at a central depot and at four minor stations, in such fulness and variety of equipment as to meet extraordinary service, and the engineering resources of the chiefs who direct the work are of the highest grade. The latest exact report of the work of scavengering in Paris obtainable by the writer is for the year 1878, when a fair estimate of the population would give a little more than 2,000,000. This exhibit, however, will sufficiently illustrate the French methods, which have changed but little, if any, since that time.

The roads of Paris in 1877 included a length of 558 miles, covering 8,618,236 square yards, there being also 242,782 square yards of unmetalled roads, and 15,522,654 yards of foot-paths and blind alleys. At the various minor depots scattered throughout the city were stored supplies of chlorate of zinc, sulphate of zinc, sulphate of iron, carbolic acid, hydrochloric acid, and nitrobenzide as cleansing agents. These were thoroughly used for the disinfection of places tainted with urine or fæcal matter, cleansing gutters carrying sewage, and washing and watering the markets. The annual cost of plant and disinfecting materials was a little over $40,000. The force employed in sweeping and washing the Paris streets consisted of 2200 men, 950 women, and 30 boys, the wages paid ranging from 2½ francs to 1½ francs per day. The plant, in addition to the hand implements, consisted of 190 mechanical sweepers of the most improved models, each with the capacity of 10 man-power, and practically adding 1900 laborers to the force; and 322 water-carts, in addition to the hose, which, wherever applicable, was applied to the city hydrants for flushing purposes. During the year cited, 7,139,163 square yards were daily watered by cart, and 2,783,092 by hose. The annual cost of this important function was about $90,000. The washing is all done directly by the street cleaners, and ordered so as to facilitate, not to increase, the labor of sweeping, as mud is the most difficult of all dirt to remove. The hand-sweeping brigade and the mechanical batteries, as they might be called, perform their labors between 3 and 6 A.M. in summer, and between 4 and 7 A.M. in the winter. The carts for removing the public and private refuse operate from 6 to 8 A.M. in summer, and from 7 to 9 A.M. in winter. Each cart is attended by a driver and two shovellers, the latter having to provide during the rest of the day supplemental sweeping, as ordered by the inspectors continually patrolling the city on the outlook for the great enemy, dirt. The same men have also the duty of rinsing the gutters twice a day, and of cleaning and disinfecting urinals, etc. All the work of sweeping and washing the streets, which is done at least once and sometimes twice a day throughout the paved area of the city, and of removing house and street refuse is completely finished by 4 P.M., except in unfavorable weather. The same "street orderly" system used in the City of London is also a feature of the Paris method, and is found equally advantageous and economical.

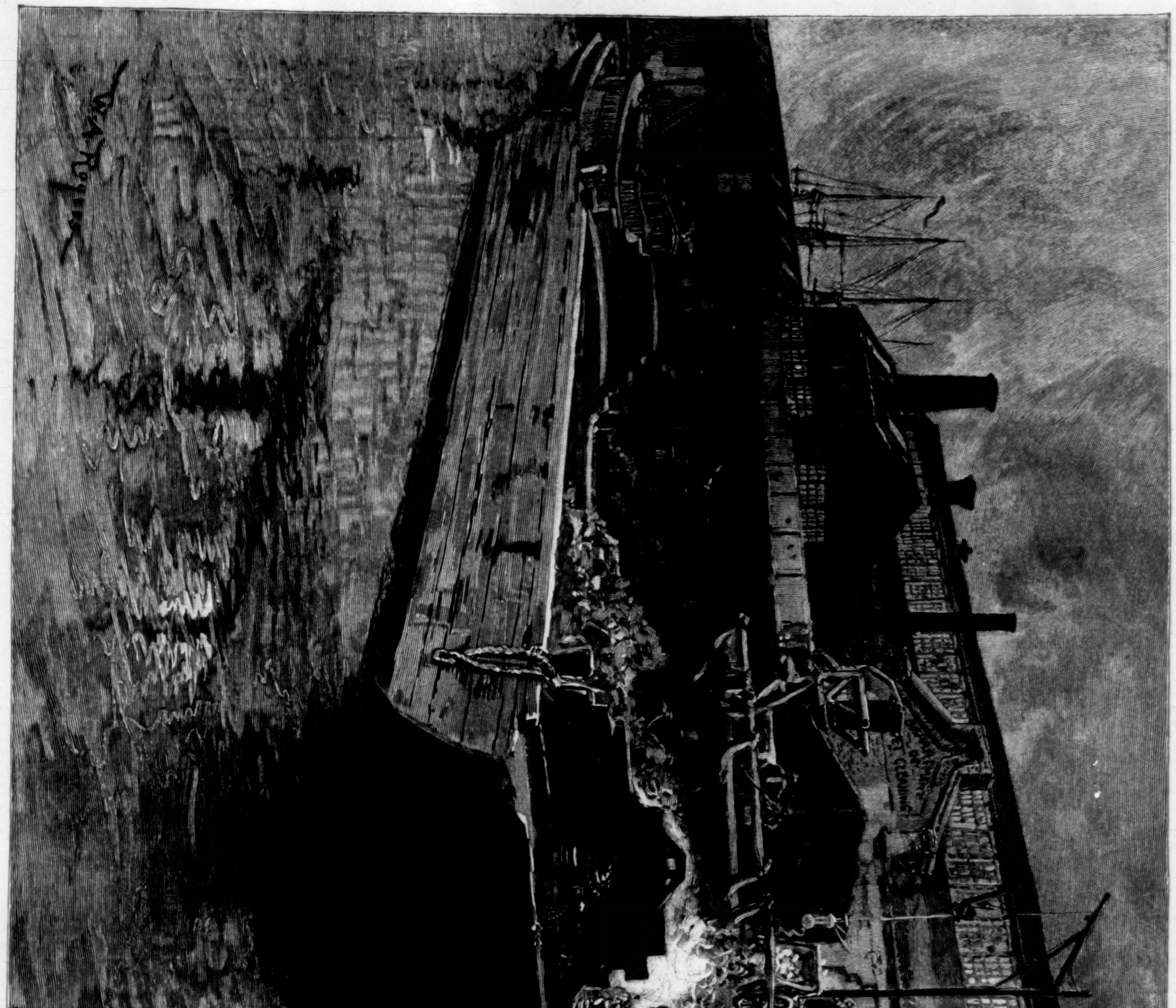
Paris refuse is disposed of by public tender to responsible contractors for a term of four years. In 1877, when the city had a population of say 2,000,000, the average bulk removed per diem was about 2223 cubic yards, requiring the daily use of 520 carts and 980 horses. Of course the reader will understand that by the methods of street flushing from the hydrants in those portions of the city which make dirt the most rapidly, much of the refuse and dirt is disposed of through the sewers, lessening to that extent the burden of cartage. Apropos of the method of disposition, it is understood that the decrease in manurial value of the Paris mud year by year, specially since the street orderly system was introduced, is making it more and more difficult to dispose of the street sweepings by contract, and some new method of getting rid of the accumulation of worthless stuff will have to be discovered. The Paris rag-pickers of the past, as well as the London rag-pickers of the past, no longer exist, and the possibilities of the "golden dustman" have ceased. Only a few years ago an aged *chiffonnière* of Paris, who had plied her disgusting craft for nearly three-quarters of a century, died, and in her wretched apartment a quarter of a million francs was found stuffed away in gold and bank-notes. Since the adoption of the contract system of final disposition in whole or part, the picturesque but unutterably filthy and disgusting methods of the independent rag-picker have ceased in London and Paris. In New York, however, the work goes merrily on, and the labors of the street-sweeper have to some extent to be twice performed in consequence. It is safe to conclude that the experience of the two great cities of Europe shows one result. The commercial value of material that can be utilized in city refuse is continually decreasing, and it will soon become a serious question whether sorting the dust heaps is really worth the labor and trouble it involves. Aside from this, the sanitary questions involved in the propagation of diseases are beginning to arouse serious alarm as connected with the commercial side of the question.

The topographical conditions of Manhattan Island, which includes that larger portion of the metropolis of New York lying within the jurisdiction of the department of street-cleaning, are favorable to good drainage. A long narrow strip of land compassed within two magnificent waterways, and with the boundless sea only a few miles away from its wharves, should offer but few natural difficulties to skilled engineering in solving the problem of good sewerage and disposition of city refuse. Other things being equal, New York should be the best sewered and the cleanest of cities. This is precisely what the city is not. Of the great cities of the civilized world, it is without question the filthiest in summer and winter, in wet weather and dry weather. Engineers estimate that at least one-third of the dirt of London is derived from the atmosphere, the soot belched forth from a million of chimneys. From this, as from some other aggravating causes, New York is free. Let us then look at the main causes which conduce to make this city the pigpen it is, and at those which operate to interfere with the effective work of cleansing the pigpen. The desirable reforms are diminution of the causes which make dirt, and perfecting the agencies which remove it. Both of these easily lie within the grasp of the people of New York, or of that intelligent public opinion which is the force behind administration.

The dirt-producing causes common to all cities exist in excess in New York in three out of the four principal classes. These are horse droppings; dirt forced up from the substratum through crevices in the pavement; and the overflow of house and shop refuse in the street. The other main agency, the deposit of dust and other waste matters suspended in the air, probably afflicts New York less than it does most European cities. Let us take a brief glance at these consecutively.

Firstly, horse droppings. This material, valuable as manure if collected at once, is rapidly ground to powder under the friction of wheel and hoof. It thus adds an offensive element to the body of the street dirt, or, flying in the air, becomes a dangerous fact in the sanitary sense. All commercial use is destroyed by lack of care in gathering it promptly. As we have seen in London and Paris (and in many other European cities), the fresh manure is promptly collected by street orderlies. The amount of valuable fertilizing material which could be sold if properly cared for would be worthy of consideration. Under existing conditions, instead of affording a possible income to the street-cleaning bureau, it increases expense by greatly adding to the burden of matter to be swept, carted away, and disposed of as rubbish. There are probably not less than 100,000 horses in the city of New York, and at least half of their excrement is deposited in the public thoroughfares.

Secondly, as to the dirt forced upward through the joints of pavement by various causes. Paving in New York is laid by contract under the auspices of the Board of Public Works. To all intents and purposes we may consider the material as confined to granite blocks, though asphalt, macadam, and wooden pavement have been coquetted with from time to time. The theory of the granite block pavement presupposes that the joints shall be made water-proof with hot tar and gravel, which, of course, would give full protection against the dirt beneath as well as from water. But this is for the most part mere theory. It is more than doubtful whether the work is ever thoroughly done at the beginning. Those who watch the process of such things in New York have constant occasion to note the slovenly nature of the execution. A month or two generally suffices to show the uncovered joints. The tendency of the subsoil to work up, according to London and Paris engineering reports, accounts for a large portion of the street dirt, except in the case of asphalt pavement. Of course the more careless the paving, the greater the uprisal of earth from below. Again, pavement is rarely patched or mended except in a most desultory way, though the importance of maintenance is fully equal to that of first structure. Innumerable breaks, ruts, and holes tend to make and hold the dirt. The street-car system, so universal in American cities, aggravates the problem. The centre and side-bearing rails in general use offer irresistible temptation to the truckman to



THE GARBAGE DUMP AND HEAD-QUARTERS OF THE NEW YORK STREET-CLEANING DEPARTMENT, EAST RIVER.—Drawn by W. A. Rogers.